

**FINAL MARINE GEOTECHNICAL SITE  
CHARACTERIZATION**

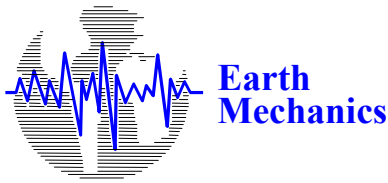
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
EAST SPAN SEISMIC SAFETY PROJECT**

**VOLUME 2H - APPENDICES**  
**(CPT Soundings 00C-1 through 00C-15,**  
**00C-17 through 00C-74, 00C-76 through 00C-79)**



**Prepared for**  
**CALIFORNIA DEPARTMENT OF TRANSPORTATION**

**March 2001**



**Fugro - Earth Mechanics**  
A JOINT VENTURE

March 5, 2001  
Project No. 98-42-0054

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Attention: Mr. Mark Willian  
Contract Manager

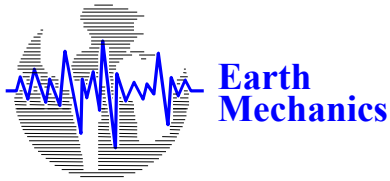
**Final Marine Geotechnical Site Characterization  
SFOBB East Span Seismic Safety Project**

Dear Mr. Willian:

The geologic and geotechnical studies for the San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project are being conducted by Fugro-Earth Mechanics (a joint venture of Fugro West, Inc., and Earth Mechanics, Inc.) under California Department of Transportation (Caltrans) Contract 59A0053. The marine exploration borings were conducted in 1998 as part of the Task 3 preliminary site exploration and testing (Phase 1) and Task 5 final site characterization studies (Phases 2 and 3) of the referenced contract. In addition, two-dimensional (2-D) and three-dimensional (3-D) marine geophysical surveys were conducted as part of Task 1 (initial site characterization, geophysical survey phase) of the referenced contract. Additional exploration (Phase 3) including cone penetration test (CPT) soundings, multi-beam bathymetry, and a supplemental 2-D geophysical survey were conducted in 2000 as part of Task 5.

The interpretation of the site and subsurface characteristics beneath the marine portion of the bridge alignment are provided in Volume 1 of this Final Marine Geotechnical Site Characterization report. The interpretations presented in Volume 1 are based on the field data (including extensive in situ testing, soil sampling, rock coring, and downhole geophysical logging) from the 44 marine borings, 77 CPT soundings, the results of laboratory tests completed in the onshore laboratories, and the integration of those data with prior Caltrans' marine borings and the interpretation of the 2-D and 3-D geophysical surveys.

The Preliminary Marine Geotechnical Site Characterization report containing Phase 1 data and preliminary site characterization information was submitted in June 1998. Volume 1 of the Final Marine Geotechnical Site Characterization Report, which contained revisions to the preliminary interpretations, was provided in draft on February 1, 2000. Volume 2 of the Final Marine Geotechnical Site Characterization Report (including only data from the Phase 2 site investigations) was submitted in draft in 1999. The Phase 3 site investigations were performed in August and September 2000. During the finalization of this report, all pertinent data from the preliminary (Phase 1) and final (Phases 2 and 3) marine site characterization activities were compiled into Volume 2 of this report. This Final Marine Geotechnical Site Characterization report thus completely supersedes the Preliminary Marine Geotechnical Site Characterization report, dated June 1998. The report is a stand-alone submittal that includes all data collected and the most recent interpretations of site characterization in the marine areas of the project.



**Fugro - Earth Mechanics**  
A JOINT VENTURE

California Department of Transportation  
March 5, 2001 (Fugro 98-42-0054)


Because of the size of the data set, Volume 2 of this report has been bound into eight volumes, designated as Volumes 2A through 2H. Boring logs and data from each of the 44 marine borings are presented in Volumes 2A through 2G. Those data are organized into boring-specific compilations for each of the 14 Phase 1 borings (Volumes 2A and 2B) and 30 Phase 2 borings (Volumes 2C through 2G). Logs of the 77 CPT soundings performed during Phase 3 are presented in Volume 2H.


On behalf of the project team, we appreciate the opportunity to contribute to Caltrans' design of the new bridge to replace the existing SFOBB East Span. Please call if we can answer any questions relative to the information presented in the enclosed report.

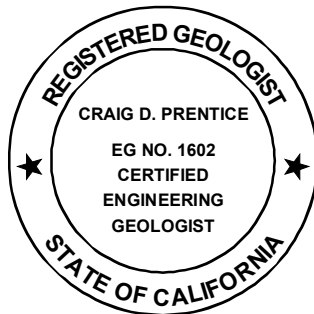
Sincerely,

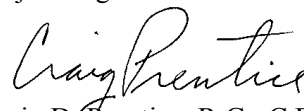
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**SAN FRANCISCO-OAKLAND BAY BRIDGE  
EAST SPAN SEISMIC SAFETY PROJECT**  
CALTRANS CONTRACT 59A0053

**FINAL MARINE GEOTECHNICAL SITE  
CHARACTERIZATION**

**VOLUME 2H - APPENDICES  
(CPT Soundings 00C-1 through 00C-15,  
00C-17 through 00C-74, 00C-76 through 00C-79)**

MARCH 2001

Prepared For:

CALIFORNIA DEPARTMENT OF TRANSPORTATION  
Engineering Service Center  
Office of Structural Foundations  
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Single page boring logs with CPT data							4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
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K <sub>o</sub> -Consolidated undrained triaxial compression test results							14a-b			14.1,2	14a-c				15	15	15	15	15a-c	15a-b	15.1,2	15.1,2	15a-b	15a-b	15.1,2	15.1,2	15.1,2	15.1,2	15.1,2	15a-d	15a-b	15	15	15	15	15	15	15	15	15	15	15	15	15	15		
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Liquidity index	10		12		11	12	17	15	16	17	16	16	12	16	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	
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ε <sub>50</sub>			14		13	14	19	17	18	19	18	18	14	18	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
Preconsolidation stress							20	18	19	20	19	19	15	19	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Relative Density															22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	

Testing performed

No testing performed

Log provided

No log provided

APPENDIX PLATE NUMBERING  
REFERENCE GUIDE



## **VOLUME 2**

### **INDIVIDUAL BORING DATA AND CPT SOUNDING APPENDICES**

The San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project marine geotechnical site exploration included 44 borings and 77 Seacalf CPT soundings. The marine drilling was completed using offshore drilling equipment and wire-line sampling, in situ testing, and downhole tools. In addition, 49 tethered Seascout CPT soundings were conducted adjacent to the boring locations to characterize the near-surface materials.

#### **GEOTECHNICAL SITE CHARACTERIZATION SYNOPSIS - VOLUME 1**

A general description of Task Order Nos. 3 and 5, the Marine Site Characterization work scope, is provided in Section 1.0 of Volume 1. A description of the marine exploration and subsequent laboratory testing procedures is included in Section 3.0. The locations of the borings are provided on Plate A-1, and a summary of the details of the individual exploration locations and depths is provided in Table 3.1 of Volume 1.

#### **INDIVIDUAL BORING APPENDICES - VOLUMES 2A THROUGH 2G**

Individual boring appendices are provided for each of the 44 borings. Each boring appendix includes boring logs and various in situ, downhole, and laboratory data.

##### **Boring Appendices Collation and Plate Number Guide**

A table is provided at the end of the Volume 2 Table of Contents that shows the plate titles and numbers included in each boring-specific appendix. The individual appendix plates are numbered with the boring number and a sequential number (e.g., 98-28.4, 98-28.5a, etc.).

##### **Key to Terms and Symbols Used on the Boring Logs**

A description of the terms and symbols used on the logs is provided on Plates A-2a and A-2b in Volumes 2A through 2G.

##### **Summary of Field Operations and Location/Depth Information**

A description of the progress of the individual borings and a chart showing boring location, coordinates, depths (mudline, top of rock, bottom of borings, etc.), and corresponding elevations (re: Mean Sea Level [MSL] datum, as specified by Caltrans) are included at the beginning of each boring appendix.

## Boring Logs

The boring logs for each marine boring provide lithology descriptions, show sampling depths, contain descriptions of the soil and rock characteristics, and provide plotted remote vane, laboratory, and downhole geophysical test data. The appendices include three single-page boring logs (the data for the entire depth of the borings are shown on one page) that show geotechnical test data, CPT data, and downhole geophysical data, respectively. In addition to the single-page logs, multiple-page logs that show geotechnical test data and CPT data are provided at an expanded depth scale. Also included in the marine boring appendices is a geotechnical test data log of the near surface sediments with an expanded undrained shear strength scale.

**Geotechnical Test Data Logs.** Sampler types are shown on the Key to Terms and Symbols Used on Logs (Plates A-2a and A-2b in Volumes 2A through 2G). The following nomenclature applies to the information in the blow count column of the log: a) "PUSH" denotes thin-wall tube samples pushed with the weight of the drill pipe; b) "WOH" denotes liner samplers advanced by the weight of the down-hole hammer; c) values such as 18 designate either Standard Penetration Test (SPT) N-values or California modified sampler; d) 50/7.5cm is a SPT N-value; and e) 30/60cm is a downhole, wireline hammer blow count. Additional description of the blow count and sampler nomenclature is provided on Plates A-2a and A-2b of Volumes 2A through 2G.

Rock coring data also are tabulated in the Blow Count column. Those data, such as 100-35, provide recovery and Rock Quality Designation (RQD) data for the individual core runs.

The center column of the log provides water content, plastic limit, liquid limit, percent passing the number 200 sieve, and density measurements (presented as submerged unit weights). In addition to the direct measurements of density, the logs also show the theoretical submerged unit weight based on the measured water content, an assumed specific gravity of 2.7, and an assumed 100-percent saturation. In rock intervals, the recovery, RQD, and coring rate are plotted in the center column of the log.

The right-hand column presents the results of the undrained shear strength measurements conducted on samples recovered from the borings as well as the strengths measured in situ using the Halibut and Dolphin remote vane tools. The range of undrained shear strengths that are calculated from CPT cone tip resistances (corrected for unequal end area effects) also are shown based on cone bearing capacity ( $N_k$  values) of 12 and 15. Undrained shear strengths measured on remolded samples also are included in the plotted data.

In rock intervals, the unconfined compressive strength measured in unconfined tests and estimated from point load tests are plotted in the right-hand column. Fracture density also is plotted in the rock intervals.



**CPT Logs.** The in situ CPTs were conducted downhole using the Dolphin system. This downhole in situ tool has a maximum stroke (or test length) of 3 meters. Data are acquired in 3-meter-long increments, or until the CPT meets refusal. The CPT intervals were interspersed with soil sampling. The CPT intervals are shown on the right of the geotechnical test data logs and CPT logs.

The CPT logs for each boring with CPT data provide graphical plots of the data versus depth below mudline (or Bay bottom). Data that are shown include: a) tip resistance in megapascals (MPa), b) sleeve friction in MPa, c) excess pore pressure readings in MPa, and d) friction ratio in percent.

**Downhole Geophysical Logs.** Downhole geophysical tests were conducted in 41 of the 44 marine borings. That testing included:

- a) Compression and shear wave ( $V_p$  and  $V_s$ , respectively) (except for Borings 98-19, 98-45, and 98-48);
- b) Natural gamma (only Borings 98-1 through 98-3 and 98-5 through 98-12);
- c) Resistivity (only Borings 98-2, 98-3, and 98-5 through 98-12);
- d) Caliper (borehole diameter) (only Borings 98-1 through 98-12 and 98-21 through 98-24); and
- e) Acoustic Televiwer (only Borings 98-1 through 98-5 and 98-21 through 98-24).

The Acoustic Televiwer logs are provided under separate covers in Volume 1 of Fugro-EM (1998d) and Volume 1 of Fugro-EM (2001h).

## Laboratory Test Results

The offshore and onshore laboratory test results are incorporated in the individual boring appendices. In addition to the test data plotted on the geotechnical test data logs, the appendices include the following information (where relevant):

- Remote vane test data
- Tabulated summary of test results
- Grain size distribution curves
- Plasticity chart showing the Atterberg limit data
- Stress-strain curves from unconsolidated-undrained (UU) triaxial compression tests





- Consolidation test results including axial strain and coefficient of consolidation versus effective vertical stress
- Consolidated-undrained triaxial compression test results including consolidation curves, stress path, stress-strain curves, pore water pressure-strain curves, and obliquity-strain curves
- Consolidated-drained triaxial compression test results including stress-strain curves and Mohr circles

In addition to the laboratory test results presented herein, the results of laboratory tests conducted on rock samples are provided under separate cover in Volume 4 of Fugro-EM (1998d) and Volume 2 of Fugro-EM (2001h). Also, the results of the cyclic tests conducted on samples recovered from the marine borings are provided under separate cover in Volume 3 of Fugro-EM (1998d).

### **Soil Property Profiles**

Where data are available, the following soil properties are plotted versus depth:

- Plasticity Index (Liquid Limit minus Plastic Limit)
- Liquidity Index ([water content minus Plastic Limit] divided by Plasticity Index)
- Soil Sensitivity (undisturbed shear strength divided by remolded shear strength)
- $\epsilon_{50}$  (strain at 50 percent of the failure stress in UU triaxial tests)
- Preconsolidation Pressure - The interpreted preconsolidation pressure profiles show interpreted preconsolidation pressures from consolidation tests and estimated preconsolidation pressures from the in situ CPT data. Also shown on those plots are the calculated effective overburden pressure and isochrones of calculated overconsolidation ratios (OCR).
- Relative Density from CPT test data (marine borings)

## **CPT DATA APPENDIX - VOLUME 2H**

### **Summary of Field Operations**

A description of the progress of the Seacalf CPT operations is presented before the CPT data plots in Volume 2H as Plates A-2a through A-2w.







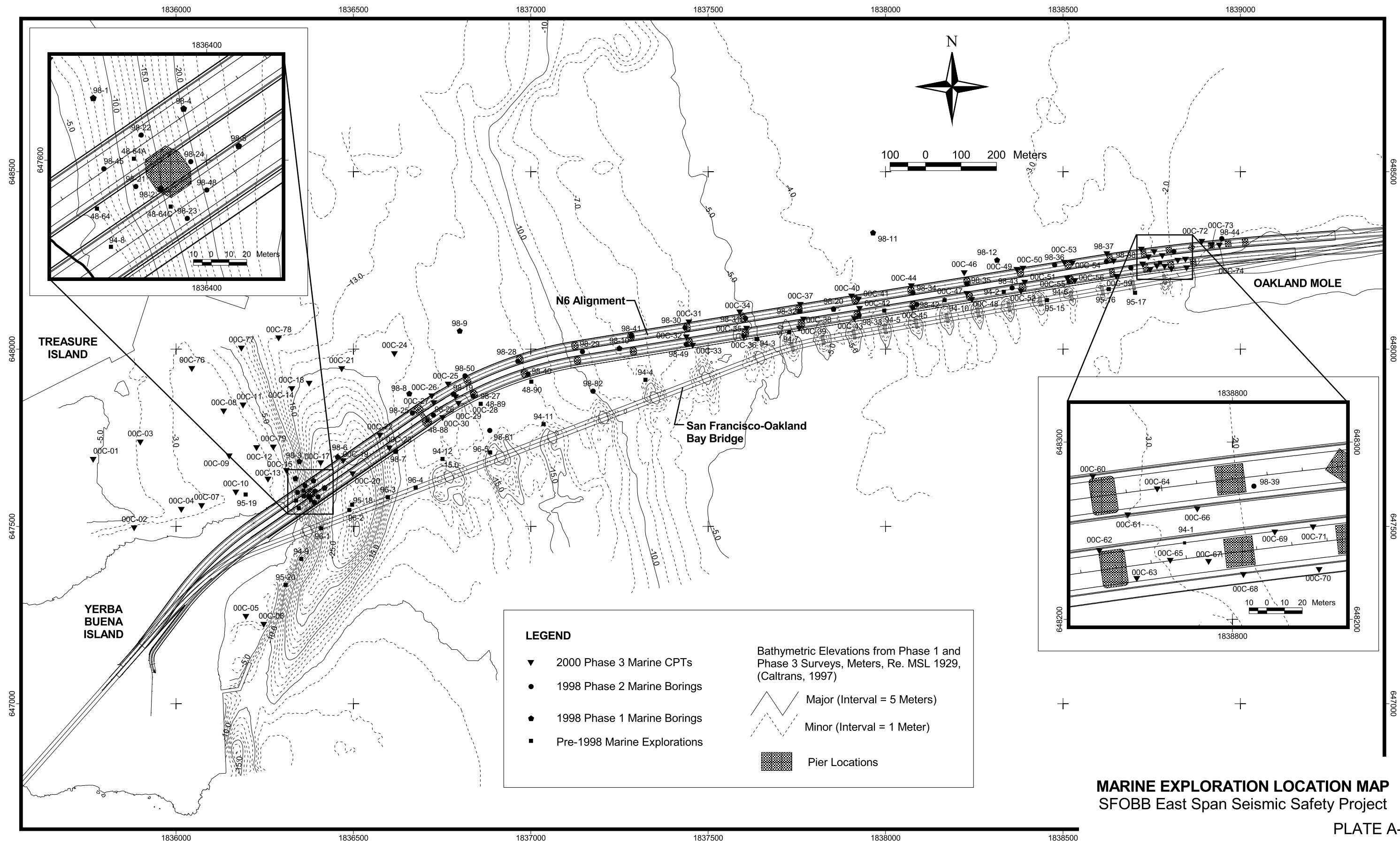
## CPT Sounding Results

The results of the 77 marine CPT soundings are presented in Volume 2H of this report. The CPT logs provide graphical plots versus depth showing:

- Tip resistance in MPa
- Sleeve friction in MPa
- Friction ratio in percent
- Pore pressure in MPa

In addition, the sounding logs show the range of undrained shear strengths that are calculated from CPT tip resistances (corrected for unequal area effects) based on cone bearing capacity factors ( $N_k$ ) of 12 and 15.





**MARINE EXPLORATION LOCATION MAP**  
SFOBB East Span Seismic Safety Project



Date	Time		Description of Activity
	From	To	
September 23, 2000	0600	1130	Barge No. 32 travels from C.S. Marine's Yard at Mare Island to just east of Treasure Island.
	1130	1200	Crew boards barge and sets up lab and CPT equipment.
	1200	1215	General safety meeting with Fugro, FMMG, Weststar, and C. S. Marine.
	1215	1235	Position barge at location 00C-31.
	****	1235	Measure water depth of 6.1m using bottom sensor. Current tide level is approximately 0.2m MSL. Calculate approximate mudline elevation of -5.9m MSL.
	1235	1615	Rig up for sounding. Lower frame to mudline.
	1615	1650	Advance CPT from mudline to 36.2m.
	1650	1750	Pull CPT rods to deck and raise frame.
	1750	1825	Pull two spuds, and move barge to location 00C-72. Position barge and set two spuds.
	1825	1920	Rig up for sounding. Lower frame to mudline.
	****	1915	Measure water depth of 2.1m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -1.7m MSL.
	1920	1930	Advance CPT from mudline to 11.2m.
	1930	2005	Set casing to 10m.
	2005	2045	Advance CPT from 11.2m to 51.7m.
	2045	2315	Pull CPT casing and rods to deck, and raise frame.
	2315	2340	Pull two spuds, and move barge to location 00C-63.
	2340	2400	Position barge at location 00C-63.
September 24, 2000	0000	0010	Position barge and set two spuds.
	0010	0040	Rig up for sounding.
	****	0055	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately -0.2m MSL. Calculate approximate mudline elevation of -2.9m MSL.
	0040	0100	Fugro onboard safety meeting.
	0100	0120	Lower frame to mudline. Advance CPT from mudline to 9.3m.
	0120	0210	Set casing to m.
	0210	0245	Advance CPT from 9.3m to 51m.
	0245	0500	Pull CPT casing and rods to deck, and raise frame.

**SUMMARY OF FIELD OPERATIONS**  
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Date	Time		Description of Activity
	From	To	
September 24, 2000	0500	0520	Pull two spuds, and move barge to location 00C-62. Position barge and set two spuds.
	0520	0620	Rig up for sounding.
	****	0625	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately 0.6m MSL. Calculate approximate mudline elevation of -3.3m MSL.
	0620	0700	Lower frame to mudline. Advance CPT from mudline to 37.6m.
	0700	0740	Pull CPT rods to deck and raise frame.
	0740	0830	Pull two spuds, and move barge to location 00C-68. Position barge and set two spuds.
	0830	0840	Reposition barge at location 00C-68.
	0840	1040	Rig up for sounding. Prepare new rods.
	****	1025	Measure water depth of 4.6m using bottom sensor. Current tide level is approximately 0.7m MSL. Calculate approximate mudline elevation of -3.9m MSL.
	1040	1120	Lower frame to mudline. Advance CPT from mudline to 9.5m.
	1120	1215	Set casing to 8m.
	1215	1250	Advance CPT from 9.5m to 42.3m.
	1250	1415	Pull CPT casing and rods to deck, and raise frame.
	1415	1435	Pull two spuds, and move barge to location 00C-69. Position barge and set two spuds.
	1435	1455	Perform service on lower bottom sensor sender unit.
	1455	1505	Lower frame to mudline.
	****	1455	Measure water depth of 2.1m using bottom sensor. Current tide level is approximately -0.2m MSL. Calculate approximate mudline elevation of -2.3m MSL.
	1505	1510	Advance CPT from mudline to 9.0m.
	1510	1610	Set casing to 9.0m.
	1610	1635	Advance CPT from 9.0m to 40.0m.
	1635	1740	Pull CPT casing and rods to deck, and raise frame.
	1740	1750	Pull two spuds, and move barge to location 00C-71. Position barge and set two spuds.
	1750	1830	Rig up for sounding.
	1830	1845	Lower frame to mudline. Advance CPT from mudline to 11.2m.

**SUMMARY OF FIELD OPERATIONS**  
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Date	Time		Description of Activity
	From	To	
September 24, 2000	****	1845	Measure water depth of 1.8m using bottom sensor. Current tide level is approximately 0.2m MSL. Calculate approximate mudline elevation of -0.6 MSL.
	1845	1900	Pull rods to deck and raise frame.
	1900	1910	Pull two spuds, and move barge to location 00C-70. Position Barge and set two spuds.
	1910	1925	Lower frame to mudline. Advance CPT from mudline to 11.9m.
	1925	1945	Pull rods to deck and raise frame.
	****	1940	Measure water depth of 2.1m using bottom sensor. Current tide level is approximately 0.6m MSL. Calculate approximate mudline elevation of -1.5m MSL.
	1945	2000	Pull two spuds and move to location 00C-073. Position barge and set two spuds.
	2000	2030	Lower frame to mudline. Advance CPT from mudline to 18.0m.
	2030	2050	Pull rods and raise frame to deck.
	****	2050	Measure water depth of 2.1m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -1.2m MSL.
	2050	2115	Pull two spuds and move to location 00C-064. Position barge and set two spuds.
	2115	2145	Perform maintenance on CPT.
	2145	2230	Rig up for sounding. Service hydraulics.
	****	2220	Measure water depth of 3.8m using bottom sensor. Current tide level is approximately 1.0m MSL. Calculate approximate mudline elevation of -2.8m MSL.
	2230	2240	Advance CPT from mudline to 13.3m.
	2240	2310	Set casing to 10m.
	2310	2345	Advance CPT from 13.3m to 50.0m.
	2345	2400	Pull CPT rods and casing to deck, and raise frame.
September 25, 2000	0000	0145	Pull CPT rods and casing to deck, and raise frame.
	0145	0210	Pull two spuds and move to location 00C-32. Position barge and set two spuds.
	0210	0240	Rig up for sounding.
	0240	0305	Lower frame to mudline. Excessive frame roll. Raise frame, reposition barge. Lower frame to mudline.

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Date	Time		Description of Activity
	From	To	
September 25, 2000	****	0305	Measure water depth of 5.2m using bottom sensor. Current tide level is approximately -0.8m MSL. Calculate approximate mudline elevation of -6.0m MSL.
	0305	0400	Advance CPT to 3.9m. Pull CPT rods to deck. Raise frame.
	0400	0430	Perform diagnostics on cable and cone, change out cone. Rig up for sounding.
	0430	0520	Lower frame to mudline. Advance CPT from mudline to 32.0m.
	0520	0555	Pull rods to deck and raise frame.
	0555	0710	Pull two spuds and move to location 00C-33. Perform service on GPS equipment. Position barge and set two spuds.
	0710	0715	Rig up for sounding.
	0715	0755	Lower frame to mudline. Advance CPT from mudline to 26.5m.
	****	0725	Measure water depth of 5.2m using bottom sensor. Current tide level is approximately -0.4m MSL. Calculate approximate mudline elevation of -5.6m MSL.
	0755	0825	Pull rods to deck and raise frame.
	0825	0855	Pull two spuds and move to location 00C-66. Position barge and set two spuds.
	****	0900	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately 0.2m MSL. Calculate approximate mudline elevation of -2.5 MSL.
	0855	0920	Lower frame to mudline. Advance CPT from mudline to 11.3m.
	0920	1020	Set casing to a depth of 10.5m.
	1020	1035	Advance CPT from 11.3m to 25.3m.
	1035	1130	Pull CPT rods to deck. Raise frame.
	1130	1140	Pull two spuds and move to location 00C-60. Position barge and set two spuds.
	****	1200	Measure water depth of 4.0m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -3.1 MSL.
	1140	1210	Lower frame to mudline. Advance CPT from mudline to 11.2m.
	1210	1255	Set casing to a depth of 11.0m.
	1255	1310	Advance CPT from 11.2m to 27.1m.
	1310	1410	Pull rods and casing to deck, and raise frame.
	1410	1425	Pull two spuds and move to location 00C-61. Position barge and set two spuds.

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Date	Time		Description of Activity
	From	To	
September 25, 2000	1425	1445	Replace 10 meters of CPT rods.
	1445	1450	Rig up for sounding.
	****	1450	Measure water depth of 3.0m using bottom sensor. Current tide level is approximately -0.1m MSL. Calculate approximate mudline elevation of -3.1 MSL.
	1450	1520	Lower frame to mudline. Advance CPT from mudline to 26.4m.
	1520	1550	Pull rods and casing to deck, and raise frame.
	1550	1610	Pull two spuds and move to location 00C-34. Position barge and set two spuds.
	1610	1615	Rig up for sounding.
	1615	1640	Lower frame to mudline. Advance CPT from mudline to 26.0m.
	1640	1720	Pull rods and raise frame.
	****	1650	Measure water depth of 4.4m using bottom sensor. Current tide level is approximately -0.4m MSL. Calculate approximate mudline elevation of -4.8 MSL.
	1720	1740	Pull two spuds and move to location 00C-36. Position barge and set two spuds.
	1740	1750	Rig up for sounding.
	1750	1815	Lower frame to mudline. Advance CPT from mudline to 24.6m.
	****	1815	Measure water depth of 4.6m using bottom sensor. Current tide level is approximately -0.2m MSL. Calculate approximate mudline elevation of -4.8m MSL.
	1815	1845	Pull rods and raise frame.
	1845	1910	Pull two spuds and move to location 00C-35. Position barge and set two spuds.
	1910	1930	Lower frame to mudline. Advance CPT from mudline to 13.3m.
	****	1920	Measure water depth of 4.9m using bottom sensor. Current tide level is approximately 0.1m MSL. Calculate approximate mudline elevation of -4.8m MSL.
	1930	2005	Set casing to a depth of 10m.
	2005	2035	Advance CPT from 13.3m to 35.0m.
	2035	2145	Pull casing and rods to deck, and raise frame.
	2145	2200	Pull two spuds, and move barge to location 00C-74. Position barge and set two spuds.
	2200	2210	Rig up for sounding.
	2210	2225	Lower frame to mudline. Advance CPT from mudline to 12.7m

**SUMMARY OF FIELD OPERATIONS**  
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Date	Time		Description of Activity
	From	To	
September 25, 2000	****	2220	Measure water depth of 2.0m using bottom sensor. Current tide level is approximately 1.0m MSL. Calculate approximate mudline elevation of -1.0m MSL.
	2225	2245	Pull rods to deck and raise frame.
	2245	2300	Pull two spuds, and move barge to location 00C-67. Position barge and set two spuds.
	2300	2315	Lower frame to mudline. Advance CPT from mudline to 9.9m.
	***	2310	Measure water depth of 3.4m using bottom sensor. Current tide level is approximately 1.1m MSL. Calculate approximate mudline elevation of -2.3m MSL.
September 26, 2000	2315	0000	Set casing to a depth of 9.0m.
	0000	0025	Advance CPT from 9.9m to 39.9m.
	0025	0145	Pull casing and rods to deck, and raise frame.
	0145	0155	Pull two spuds, and move barge to location 00C-58. Position barge and set two spuds.
	0155	0245	Rig up for sounding. Perform diagnostics on cable.
	0245	0305	Lower frame to mudline. Advance CPT from mudline to 14.8m.
	****	0250	Measure water depth of 3.0m using bottom sensor. Current tide level is approximately -0.4m MSL. Calculate approximate mudline elevation of -3.4m MSL.
	0305	0400	Set casing to a depth of 10.5m.
	0400	0415	Advance CPT from 14.8m to 27m.
	0415	0515	Pull casing and rods to deck, and raise frame.
	0515	0600	Pull two spuds and move to location 00C-65. Position barge and set two spuds.
	0600	0620	Rig up for sounding.
	****	0615	Measure water depth of 1.8m using bottom sensor. Current tide level is approximately -1.0m MSL. Calculate approximate mudline elevation of -2.8m MSL.
	0620	0700	Lower frame to mudline. Advance CPT from mudline to 30.0m.
	0700	0740	Pull rods to deck and raise frame.
	0740	0810	Pull two spuds and move to location 00C-09. Position barge and set two spuds.
	0810	0820	Rig up for sounding.
	***	0810	Measure water depth of 2.1m using bottom sensor. Current tide level is approximately -0.3m MSL. Calculate approximate mudline elevation of -2.4m MSL.

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Date	Time		Description of Activity
	From	To	
September 26, 2000	0820	0835	Lower frame to mudline. Advance CPT to 15.9m.
	0835	0915	Set casing to a depth of 14.5m.
	0915	0935	Advance CPT from 15.9m to 38.7m.
	0935	1055	Pull casing and rods to deck, and raise frame.
	1055	1105	Pull two spuds and move to location 00C-12. Position barge and set two spuds.
	1105	1150	Rig up for sounding.
	****	1200	Measure water depth of 3.7m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -2.8m MSL.
	1150	1210	Lower frame to mudline. Advance CPT to 16.4m.
	1210	1250	Set casing to a depth of 15.0m.
	1250	1310	Advance CPT from 16.4m to 37.5m.
	1310	1450	Pull casing and rods to deck, and raise frame.
	1450	1525	Pull two spuds and move to location 00C-1. Position barge and set two spuds.
	1525	1545	Rig up for sounding. Remove mud from skirt and increase winch capacity.
	****	1610	Measure water depth of 4.7m using bottom sensor. Current tide level is approximately -0.4m MSL. Calculate approximate mudline elevation of -5.1m MSL.
	1545	1605	Lower frame to mudline. Advance CPT to 13.3m.
	1605	1635	Set casing to a depth of 13.0m.
	1635	1705	Advance CPT from 13.3m to 42.5m.
	1705	2100	Pull casing and rods to deck, and raise frame. Wash out mud accumulation from skirt.
	2100	2110	Pull two spuds and move to location 00C-2. Position barge and set two spuds.
	2110	2135	Rig up for sounding. Change out cone and replace 10 meters of cone rod.
	****	2120	Measure water depth of 3.0m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -2.6m MSL.
	2135	2145	Lower frame to mudline. Advance CPT from mudline to 5.0m.
	2145	2210	Pull rods to deck and raise frame.

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Date	Time		Description of Activity
	From	To	
September 26, 2000	2210	2240	Pull two spuds and move to location 00C-7. Position barge and set two spuds.
	2240	2305	Rig up for sounding. Change out cone.
	****	2250	Measure water depth of 4.6m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -3.7m MSL.
	2305	2345	Lower frame to mudline. Advance CPT to from mudline to 16.5m.
	2345	2400	Set casing to a depth of 16.5m.
September 27, 2000	0000	0045	Set casing to a depth of 16.5m.
	0045	0052	Advance CPT to from 16.5m to 18.2m.
	0052	0220	Pull casing and rods to deck, and raise frame.
	0220	0255	Pull two spuds and move to location 00C-8. Position barge and set two spuds.
	0255	0330	Rig up for sounding.
	****	0330	Measure water depth of 1.8m using bottom sensor. Current tide level is approximately -0.3m MSL. Calculate approximate mudline elevation of -2.1m MSL.
	0330	0355	Lower frame to mudline. Advance CPT to from mudline to 17.4m.
	0355	0450	Set casing to a depth of 15.0m.
	0450	0505	Advance CPT from 17.4m to 31.5m.
	0505	0645	Pull casing and rods to deck, and raise frame.
	0645	0850	Pull two spuds and move to location 00C-21. Position barge and set 4 anchors.
	0850	1000	Rig up for sounding.
	****	0900	Measure water depth of 15.0m using bottom sensor. Current tide level is approximately -0.1m MSL. Calculate approximate mudline elevation of -15.1m MSL.
	1000	1100	Lower frame to mudline. Advance CPT to from mudline to 16.0m.
	1100	1220	Used tension rods to advance CPT from 16.0m to 25.4m.
	1220	1240	Pull rods to deck, and raise frame.
	1240	1400	Pull 4 anchors and move to location 00C-37. Position barge and set two spuds.
	1400	1440	Rig up for sounding.
	****	1440	Measure water depth of 4.9m using bottom sensor. Current tide level is approximately 0.5m MSL. Calculate approximate mudline elevation of -4.4m MSL.

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Date	Time		Description of Activity
	From	To	
September 27, 2000	1440	1500	Lower frame to mudline. Advance CPT to from mudline to 15.1m.
	1500	1520	Set casing to a depth of 14.0m.
	1520	1530	Advance CPT from 15.1m to 28.0m.
	1530	1610	Pull casing and rods to deck, and raise frame.
	1610	1635	Pull two spuds and move to location 00C-39. Position barge and set two spuds.
	1635	1655	Rig up for sounding.
	****	1650	Measure water depth of 4.0m using bottom sensor. Current tide level is approximately -0.5m MSL. Calculate approximate mudline elevation of -4.5m MSL.
	1655	1710	Lower frame to mudline. Advance CPT to from mudline to 12.9m.
	1710	1730	Set casing to a depth of 12.0m.
	1730	1740	Advance CPT from 12.9m to 24.5m.
	1740	1820	Pull casing and rods to deck, and raise frame.
	1820	1900	Pull two spuds and move to location 00C-04. Position barge and set two spuds.
	1900	1920	Rig up for sounding.
	****	1910	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately -0.7m MSL. Calculate approximate mudline elevation of -3.4m MSL.
	1920	1945	Lower frame to mudline. Advance CPT to from mudline to 16.3m.
	1945	2000	Set casing to a depth of 14.0m.
	2000	2020	Advance CPT from 16.3m to 22.3m.
	2020	2125	Pull casing and rods to deck, and raise frame.
	2125	2135	Pull two spuds and move to location 00C-10. Position barge and set two spuds.
	2135	2145	Rig up for sounding.
	****	2135	Measure water depth of 3.3m using bottom sensor. Current tide level is approximately 0.1m MSL. Calculate approximate mudline elevation of -3.2m MSL.
	2145	2200	Lower frame to mudline. Advance CPT to from mudline to 15.3m.
	2200	2230	Set casing to a depth of 14.0m.
	2230	2240	Advance CPT from 15.3m to 17.3m.
	2240	2355	Pull casing and rods to deck, and raise frame.
	2355	2400	Pull two spuds and move to location 00C-13.

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Date	Time		Description of Activity
	From	To	
September 28, 2000	0000	0020	Position barge at location 00C-13 and set two spuds.
	0020	0110	Rig up for sounding.
	****	0050	Measure water depth of 4.0m using bottom sensor. Current tide level is approximately +0.9m MSL. Calculate approximate mudline elevation of -3.1m MSL.
	0050	0110	Lower frame to mudline. Advance CPT from mudline to 12.6m.
	0110	0150	Set casing to a depth of 12.5m.
	0150	0200	Advance CPT from 12.6m to 21.6m.
	0200	0315	Pull casing and rods to deck, and raise frame.
	0315	0355	Pull two. spuds and move to location 00C-15. Position barge and set two spuds.
	0355	0430	Rig up for sounding.
	****	0425	Measure water depth of 4.3m using bottom sensor. Current tide level is approximately -0.3m MSL. Calculate approximate mudline elevation of -4.6m MSL.
	0430	0445	Lower frame to mudline. Advance CPT from mudline to 9.5m.
	0445	0525	Set casing to a depth of 8.5m.
	0525	0535	Advance CPT from mudline to 16.8m.
	0535	0635	Pull rods to deck, and raise frame.
	0635	0720	Pull spuds and move to location 00C-17. Set anchors.
	0720	0915	Position not holding steady due to strong current.
	0915	1010	Pull anchors and move to location 00C-11. Position barge and set two spuds.
	****	1010	Measure water depth of 3.4m using bottom sensor. Current tide level is approximately 0.1m MSL. Calculate approximate mudline elevation of -3.3m MSL.
	1010	1035	Rig up for sounding.
	1035	1055	Lower frame to mudline. Advance CPT from mudline to 15.7m.
	1055	1140	Set casing to a depth of 14.5m.
	1140	1200	Advance CPT from 15.7m to 38.7m.
	1200	1340	Pull casing and rods to deck, and raise frame.
	1340	1400	Pull spuds and move to location 00C-3. Position barge and set two spuds.
	1400	1420	Rig up for sounding.

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Date	Time		Description of Activity
	From	To	
September 28, 2000	****	1420	Measure water depth of 4.6m using bottom sensor. Current tide level is approximately 0.8m MSL. Calculate approximate mudline elevation of -3.8m MSL.
	1420	1435	Lower frame to mudline. Advance CPT from mudline to 13.0m.
	1435	1500	Set casing to a depth of 12.0m.
	1500	1525	Advance CPT from 13.0m to 34.6m.
	1525	1640	Pull casing and rods to deck, and raise frame.
	1640	1800	Pull two spuds and move to location 00C-16. Position barge and set four anchors.
	1800	1840	Rig up for sounding. Change out cone.
	1840	1950	Lower frame to mudline. Excessive frame pitch/roll due to sloping mudline. Move to location 00C-17.
	****	1950	Measure water depth of 21.6m using bottom sensor. Current tide level is approximately -0.7m MSL. Calculate approximate mudline elevation of -22.3m MSL.
	1950	2045	Lower frame to mudline. Tensioned rods to advance CPT from mudline to 12.7m.
	2045	2140	Pull rods to deck and raise frame to surface.
	2140	2310	Pull four anchors and move to location 00C-14. Position barge and set two spuds.
	2310	2350	Rig up for sounding. Change out cone and rods.
	****	2315	Measure water depth of 10.4m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -10.0m MSL.
	2350	2400	Lower frame to mudline. Excessive frame pitch/roll due to sloping mudline.
September 29, 2000	0000	0005	Lower frame to mudline. Excessive frame pitch/roll due to sloping mudline.
	0005	0035	Raise frame.
	0035	0205	Pull two spuds and move to location 00C-18. Position barge and set four anchors.
	****	0210	Measure water depth of 16.2m using bottom sensor. Current tide level is approximately 0.8m MSL. Calculate approximate mudline elevation of -15.4m MSL.
	0205	0215	Rig up for sounding.
	0215	0245	Lower frame to mudline. Advance CPT from mudline to 18.9m.
	0245	0440	Set casing to a depth of 18.5m.

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Date	Time		Description of Activity
	From	To	
September 29, 2000	0440	0515	Advance CPT from 18.9m to 28.5m.
	0515	0845	Pull casing and rods to deck, and raise frame.
	0845	0910	Winch over to location 00C-14. Position barge.
	0910	1015	Rig up for sounding.
	****	1015	Measure water depth of 14.0m using bottom sensor. Current tide level is approximately 0.0m MSL. Calculate approximate mudline elevation of -14.0m MSL.
	1015	1035	Lower frame to mudline.
	1035	1240	Advance CPT. Pull rods to deck and raise frame to surface. Move barge about 2m (CPT location 00C-14A) and position again.
	1240	1300	Rig up for sounding. Change out cone and rods.
	****	1300	Measure water depth of 14.9m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -14.0m MSL.
	1300	1335	Lower frame to mudline. Advance CPT from mudline to 25.0m
	1335	1530	Set casing to 23.0m.
	1550	1820	Advance CPT from 25.0m to 48.0m.
	1820	2010	Pull four anchors and move to location 00C-24. Position barge and set four anchors.
	2010	2100	Rig up for sounding.
	****	2045	Measure water depth of 13.1m using bottom sensor. Current tide level is approximately -0.8m MSL. Calculate approximate mudline elevation of -12.3m MSL.
	2100	2145	Lower frame to mudline. Advance CPT from mudline to 25.7m.
	2145	2245	Set casing to a depth of 22.0m.
	2245	2315	Advance CPT from 25.7m to 51.9m.
	2315	2400	Pull casing and rods to deck, and raise frame to surface.
September 30, 2000	0000	0145	Pull casing and rods to deck, and raise frame to surface.
	0145	0430	Pull four anchors and move to location 00C-19. Position barge and set four anchors.
	0430	0520	Rig up for sounding.
	****	0520	Measure water depth of 25.3m using bottom sensor. Current tide level is approximately 0.1m MSL. Calculate approximate mudline elevation of -25.2m MSL.
	0520	0710	Lower frame to mudline. Excessive bending of rods due to high current. Raise frame to check rods.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
September 30, 2000	0710	0835	Lower frame to mudline. Advance CPT from mudline to 22.8m.
	0835	0930	Pull rods to deck, and raise frame to surface.
	0930	1030	Reset anchors and move to location 00C-20.
	1030	1035	Rig up for sounding.
	****	1035	Measure water depth of 25.9m using bottom sensor. Current tide level is approximately 0.0m MSL. Calculate approximate mudline elevation of -25.9m MSL.
	1035	1150	Lower frame to mudline. Advance CPT from mudline to 26.7m.
	1150	1250	Pull rods to deck and raise frame to surface.
	1250	1350	Pull four anchors and move to location 00C-23. Position barge and set four anchors.
	1350	1400	Rig up for sounding.
	****	1400	Measure water depth of 18.1m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -17.2m MSL.
	1400	1500	Lower frame to mudline. Advance CPT from mudline to 33.4m.
	1500	1530	Pull rods to deck and raise frame.
	1530	1600	Pull four anchors and move to location 00C-22. Position barge and set four anchors.
	1600	1620	Rig up for sounding.
	****	1620	Measure water depth of 19.5m using bottom sensor. Current tide level is approximately 0.6m MSL. Calculate approximate mudline elevation of -18.9m MSL.
	1620	1725	Lower frame to mudline. Advance CPT from mudline to 36.5m.
	1725	1830	Pull rods to deck and raise frame to surface.
	1830	1955	Pull four anchors and move to location 00C-26. Position barge and set four anchors.
	1955	2020	Rig up for sounding.
	****	2020	Measure water depth of 11.9m using bottom sensor. Current tide level is approximately -0.8m MSL. Calculate approximate mudline elevation of -12.7m MSL.
	2020	2100	Lower frame to mudline. Advance CPT from mudline to 19.0m.
	2100	2200	Set casing to a depth of 18.0m.
	2200	2235	Advance CPT from 29.0m to 51.2m.
	2235	2400	Pull rods to deck. Service hydraulic power pack and frame winch.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 1, 2000	0000	1400	Service hydraulic power pack and frame winch. Raise frame to surface.
	1400	1430	Winch over to location 00C-27. Position Barge.
	1430	1520	Rig up for sounding.
	****	1520	Measure water depth of 13.7m using bottom sensor. Current tide level is approximately 0.9m MSL. Calculate approximate mudline elevation of -12.8m MSL.
	1520	1550	Lower frame to mudline. Advance CPT from mudline to 18.6m.
	1550	1635	Set casing to a depth of 17.0m.
	1635	1720	Advance CPT from 18.6m to 56.6m.
	1720	1930	Pull rods to deck and raise frame to surface.
	1930	1950	Winch over to location 00C-30. Position barge.
	1950	2150	Rig up for sounding. Replace umbilical data cable. Change out cone.
	****	2000	Measure water depth of 11.6m using bottom sensor. Current tide level is approximately -0.6m MSL. Calculate approximate mudline elevation of -12.2m MSL.
	2150	2220	Lower frame to mudline. Advance CPT from mudline to 18.4m.
	2220	2400	Set casing to a depth of 16.0m.
	0000	0035	Advance CPT from 18.4m to 57.9m
October 2, 2000	0035	0235	Pull rods and casing to deck and raise frame to surface.
	0235	0255	Winch over to location 00C-29. Position barge.
	0255	0325	Rig up for sounding.
	****	0310	Measure water depth of 12.5m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -12.1m MSL.
	0325	0400	Lower frame to mudline. Advance CPT from mudline to 15.4m.
	0400	0915	Pull rods and casing with frame to surface.
	0915	1055	Rig up for sounding. Use casing latch to set casing with rod.
	1055	1300	Lower frame to mudline while adding casing and rods simultaneously. Advance CPT from mudline to 59.7m.
	1300	1440	Pull rods and casing to deck and raise frame.
	1440	1500	Winch over to location 00C-28. Position barge.
	****	1500	Measure water depth of 13.7m using bottom sensor. Current tide level is approximately 0.8m MSL. Calculate approximate mudline elevation of -12.9m MSL.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 2, 2000	1500	1530	Rig up for sounding.
	1530	1605	Lower frame to mudline. Advance CPT from mudline to 15.4m.
	1605	1650	Set casing to a depth of 15.0m.
	1650	1715	Advance CPT from 15.4m to 45.4m.
	1715	1845	Pull rods and casing to deck and raise frame.
	1845	1900	Winch over to location 00C-25. Position barge.
	****	1900	Measure water depth of 13.1m using bottom sensor. Current tide level is approximately 0.0m MSL. Calculate approximate mudline elevation of -13.1m MSL.
	1900	1940	Rig up for sounding.
	1940	2010	Lower frame to mudline. Advance CPT from mudline to 18.8m.
	2010	2050	Set casing to a depth of 18.0m.
	2050	2120	Advance CPT from 18.8m to 57.9m
	2120	2320	Pull rods and casing to deck and raise frame to surface.
	2320	2400	Pull four anchors and move to location 00C-26.
October 3, 2000	0000	0135	Pull four anchors and move to location 00C-26.
	****	0140	Measure water depth of 3.7m using bottom sensor. Current tide level is approximately -0.2m MSL. Calculate approximate mudline elevation of -3.8 MSL.
	0135	0155	Rig up for sounding.
	0155	0215	Lower frame and string rods to mudline.
	0215	0230	Advance CPT from mudline to 14.2m.
	0230	0300	Set casing to a depth of 12.0m
	0300	0340	Advance CPT from 14.2m to 49.9m.
	0340	0505	Pull rods and casing to deck and raise frame to surface.
	0505	0545	Pull spuds and move to location 00C-41. Set two spuds and position barge.
	0545	0610	Rig up for sounding and replace pore stone on cone.
	****	0545	Measure water depth of 4.3m using bottom sensor. Current tide level is approximately 0.5m MSL. Calculate approximate mudline elevation of -3.8 MSL.
	0610	0625	Lower frame to mudline.
	0625	0705	Advance CPT from mudline to 43.9m.
	0705	0730	Pull rods to deck and raise frame.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 3, 2000	0730	0800	Pull spuds and move to location 00C-40. Set two spuds and position barge.
	0800	0940	Rig up for sounding and change out cone.
	****	0940	Measure water depth of 3.7m using bottom sensor. Current tide level is approximately 0.0m MSL. Calculate approximate mudline elevation of -3.7 MSL.
	0940	0955	Lower frame to mudline. Advance CPT from mudline to 15.0m.
	0955	1030	Set casing to a depth of 13.0m.
	1030	1050	Advance CPT from 15.0m to 23.4m.
	1050	1200	Pull rods and casing to deck and raise frame.
	1200	1220	Pull spuds and move to location 00C-42. Set two spuds and position barge.
	1220	1240	Lower frame and rods to mudline. Advance CPT from mudline to 14.2m.
	****	1240	Measure water depth of 4.3m using bottom sensor. Current tide level is approximately 0.2m MSL. Calculate approximate mudline elevation of -4.1 MSL.
	1240	1300	Set casing to a depth of 12.0m.
	1300	1315	Advance CPT from 14.2m to 28.2m.
	1315	1400	Pull rods and casing to deck and raise frame to surface.
	1400	1415	Pull spuds and move to location 00C-43. Set two spuds and position barge.
	1415	1440	Rig up for sounding and change out cone.
	****	1420	Measure water depth of 5.3m using bottom sensor. Current tide level is approximately 0.5m MSL. Calculate approximate mudline elevation of -4.8 MSL.
	1440	1450	Lower frame to mudline. Advance CPT from mudline to 11.6m.
	1450	1515	Set casing to a depth of 9.0m.
	1515	1530	Advance CPT from 11.6m to 33.6m.
	1530	1610	Pull rods and casing to deck and raise frame.
	1610	1625	Pull spuds and move to location 00C-44. Set two spuds and position barge.
	1625	1630	Rig up for sounding and change out cone.
	****	1630	Measure water depth of 4.6m using bottom sensor. Current tide level is approximately 0.8m MSL. Calculate approximate mudline elevation of -3.8 MSL.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project







Date	Time		Description of Activity
	From	To	
October 3, 2000	1630	1640	Lower frame and rods to mudline.
	1640	1650	Advance CPT from mudline to 10.4m.
	1650	1700	Set casing to a depth of 10.0m.
	1700	1720	Advance CPT from 10.4m to 27.1m.
	1720	1800	Pull rods and casing to deck and raise frame.
	1800	1835	Pull spuds and move to location 00C-45. Set two spuds and position barge.
	1835	1900	Rig up for sounding.
	****	1900	Measure water depth of 4.3m using bottom sensor. Current tide level is approximately 0.3m MSL. Calculate approximate mudline elevation of -4.0 MSL.
	1900	1905	Lower frame to mudline.
	1905	1915	Advance CPT from mudline to 10.6m.
	1915	1930	Set casing to a depth of 9.0m.
	1930	1945	Advance CPT from 10.6m to 24.8m.
	1945	2020	Pull rods and casing to deck and raise frame to surface.
	2020	2035	Pull spuds and move to location 00C-46. Set two spuds and position barge.
	2035	2040	Rig up for sounding.
	****	2040	Measure water depth of 3.2m using bottom sensor. Current tide level is approximately -0.3m MSL. Calculate approximate mudline elevation of -3.5 MSL.
	2040	2045	Lower frame to mudline.
	2045	2055	Advance CPT from mudline to 11.2m.
	2055	2110	Set casing to a depth of 9.0m
	2110	2130	Advance CPT from 11.2m to 24.5m.
	2130	2215	Pull rods and casing to deck and raise frame.
	2215	2235	Pull spuds and move to location 00C-48. Set two spuds and position barge.
	2235	2240	Rig up for sounding.
	****	2235	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately -0.7m MSL. Calculate approximate mudline elevation of -3.4m MSL.
	2240	2250	Lower frame to mudline and advance CPT from mudline to 9.8m.
	2250	2310	Set casing to a depth of 7.0m.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 3, 2000	2310	2320	Advance CPT from 9.8m to 22.1m.
	2320	2400	Pull rods and casing to deck and raise frame.
October 4, 2000	0000	0025	Pull rods and casing to deck and raise frame.
	0025	0040	Pull spuds and move to location 00C-47. Set two spuds and position barge.
	0040	0105	Rig up for sounding.
	****	0100	Measure water depth of 3.0m using bottom sensor. Current tide level is approximately -0.5m MSL. Calculate approximate mudline elevation of -3.5m MSL.
	0105	0115	Lower frame to mudline.
	0115	0125	Advance CPT from mudline to 5.8m.
	0125	0150	Set casing to a depth of 5.0m.
	0150	0220	Advance CPT from 5.8m to 35.3m.
	0220	0320	Pull rods and casing to deck and raise frame.
	0320	0340	Pull spuds and move to location 00C-50. Set two spuds and position barge.
	0340	0400	Rig up for sounding.
	****	0400	Measure water depth of 3.7m using bottom sensor. Current tide level is approximately 0.1m MSL. Calculate approximate mudline elevation of -3.6m MSL.
	0400	0410	Lower frame to mudline.
	0410	0425	Advance CPT from mudline to 9.5m.
	0425	0515	Set casing to a depth of 8.0m.
	0515	0540	Advance CPT from 9.5m to 34.8m
	0540	0625	Pull rods and casing to deck and raise frame to surface.
	0625	0730	Pull spuds and move to location 00C-49. Set two spuds and position barge.
	****	0735	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -2.3m MSL.
	0730	0750	Lower frame to mudline.
	0750	0800	Advance CPT from mudline to 7.1m.
	0800	0830	Set casing to a depth of 6.0m.
	0830	0845	Advance CPT from 6.0m to 23.0m.
	0845	1005	Pull rods and casing to deck and raise frame. .

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 4, 2000	1005	1015	Pull spuds and move to location 00C-51. Set two spuds and position barge.
	1015	1045	Rig up for sounding.
	****	1040	Measure water depth of 3.0m using bottom sensor. Current tide level is approximately +0.1m MSL. Calculate approximate mudline elevation of -2.9m MSL.
	1045	1100	Lower frame to mudline.
	1100	1110	Advance CPT from mudline to 7.2m.
	1110	1140	Set casing to a depth of 6.0m.
	1140	1200	Advance CPT from 7.2m to 29.8m.
	1200	1250	Pull rods and casing to deck and raise frame.
	1250	1305	Pull spuds and move to location 00C-52. Set two spuds and position barge.
	1305	1310	Rig up for sounding.
	****	1310	Measure water depth of 3.4m using bottom sensor. Current tide level is approximately +0.2m MSL. Calculate approximate mudline elevation of -3.2m MSL.
	1310	1320	Lower frame to mudline.
	1320	1330	Advance CPT from mudline to 11.3m.
	1330	1345	Set casing to a depth of 6.0m.
	1345	1400	Advance CPT from 11.3m to 29.3m.
	1400	1450	Pull rods and casing to deck and raise frame.
	1450	1500	Pull spuds and move to location 00C-53. Set two spuds and position barge.
	1500	1510	Rig up for sounding.
	****	1510	Measure water depth of 3.8m using bottom sensor. Current tide level is approximately +0.5m MSL. Calculate approximate mudline elevation of -3.3m MSL.
	1510	1525	Lower frame to mudline. Advance CPT from mudline to 14.9m.
	1525	1545	Set casing to a depth of 8.0m.
	1545	1555	Advance CPT from 14.9m to 29.0m.
	1555	1645	Pull rods and casing to deck and raise frame.
	1645	1655	Pull spuds and move to location 00C-54. Set two spuds and position barge.
	1655	1700	Rig up for sounding.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 4, 2000	****	1700	Measure water depth of 4.0m using bottom sensor. Current tide level is approximately +0.7m MSL. Calculate approximate mudline elevation of -3.3m MSL.
	1700	1720	Lower frame to mudline. Advance CPT from mudline to 10.5m.
	1720	1740	Set casing to a depth of 8.0m.
	1740	1745	Advance CPT from 10.5 to 24.5m.
	1745	1820	Pull rods and casing to deck and raise frame.
	1820	1850	Pull spuds and move to location 00C-56. Set two spuds and position barge.
	1850	1900	Rig up for sounding.
	1900	1935	Lower frame to mudline. Excessive frame pitch/roll due to sloping mudline. Moved about 3m and repositioned barge.
	****	1935	Measure water depth of 3.2m using bottom sensor. Current tide level is approximately +0.3m MSL. Calculate approximate mudline elevation of -2.9m MSL.
	1935	1950	Advance CPT from mudline to 11.5m.
	1950	2010	Set casing to a depth of 9.0m.
	2010	2035	Advance CPT from 11.5m to 40.0m.
	2035	2145	Pull rods and casing to deck and raise frame to surface.
	2145	2155	Pull spuds and move to location 00C-55. Set two spuds and position barge.
	2155	2205	Rig up for sounding.
	****	2205	Measure water depth of 2.8m using bottom sensor. Current tide level is approximately -0.3m MSL. Calculate approximate mudline elevation of -3.1m MSL.
	2205	2215	Lower frame to mudline. Advance CPT from mudline to 10.3m.
	2215	2235	Set casing to a depth of 7.0m.
	2235	2250	Advance CPT from 10.3m to 26.2m.
	2250	2345	Pull rods and casing to deck and raise frame to surface.
	2345	2400	Pull spuds and move to location 00C-59. Set two spuds and position barge.
October 5, 2000	0000	0035	Rig up for sounding 00C-59.
	****	0020	Measure water depth of 2.7m using bottom sensor. Current tide level is approximately -0.7m MSL. Calculate approximate mudline elevation of -3.4m MSL.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 5, 2000	0035	0050	Lower frame to mudline. Excessive frame pitch/roll due to sloping mudline.
	0050	0100	Reposition barge.
	0100	0110	Lower frame to mudline.
	0100	0120	Advance CPT from mudline to 9.2m.
	0120	0135	Set casing to a depth of 8.0m.
	0135	0200	Advance CPT from 9.2m to 35.7m.
	0200	0310	Pull rods and casing to deck and raise frame.
	0310	0330	Pull spuds and move to location 00C-57. Set two spuds and position barge.
	****	0330	Measure water depth of 3.1m using bottom sensor. Current tide level is approximately -0.2m MSL. Calculate approximate mudline elevation of -3.3m MSL.
	0330	0345	Lower frame to mudline.
	0345	0355	Advance CPT from mudline to 13.6m.
	0355	0440	Set casing to a depth of 12m.
	0440	0505	Advance CPT from 13.6m to 26.4m.
	0505	0545	Pull rods and casing to deck and raise frame to surface.
	0545	0625	Pull spuds and move to location 00C-5. Set two spuds and position barge.
	****	0625	Measure water depth of 3.3m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -1.8m MSL.
	0625	0650	Lower frame to mudline.
	0650	0655	Advance CPT from mudline to 7.5m.
	0655	0730	Set casing to a depth of 7m.
	0730	0735	Advance CPT from 7.5m to 11.6m.
	0735	0810	Pull rods and casing to deck and raise frame to surface.
	0810	0820	Pull spuds and move to location 00C-6. Set two spuds and position barge.
	****	0820	Measure water depth of 3.3m using bottom sensor. Current tide level is approximately 0.4m MSL. Calculate approximate mudline elevation of -2.9m MSL.
	0820	0840	Lower frame to mudline.
	0840	0910	Excessive frame pitch/roll due to sloping mudline. Reposition barge.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 5, 2000	0910	0915	Advance CPT from mudline to 9.1m.
	****	0910	Permission granted from Coast Guard to remain on location until 11:00.
	0915	0935	Set casing to a depth of 8m.
	0935	0945	Advance CPT from 9.1m to 13.8m.
	0945	1010	Pull rods and casing to deck and raise frame.
	****	1010	Measure water depth for the revised location is 2.4m. Current tide level is approximately +0.3m MSL. Calculate approximate mudline elevation of -2.1m MSL.
	1010	1025	Pull spuds and move to location 00C-76. Set two spuds and position barge.
	1025	1300	Maintenance on CPT equipment and barge generator.
	1300	1310	Rig up for sounding.
	****	1310	Measure water depth of 2.6m using bottom sensor. Current tide level is approximately +0.1m MSL. Calculate approximate mudline elevation of -2.5m MSL.
	1310	1325	Lower frame to mudline. Advance CPT from mudline to 16.0m.
	1325	1410	Set casing to a depth of 14.0m.
	1410	1435	Advance CPT from 16.0m to 50.0m.
	1435	1545	Pull rods and casing to deck and raise frame.
	1545	1600	Pull spuds and move to a location 00C-77. Set two spuds and position barge.
	1600	1605	Rig up for sounding.
	****	1605	Measure water depth of 6.4m using bottom sensor. Current tide level is approximately +0.4m MSL. Calculate approximate mudline elevation of -6.0m MSL.
	1605	1630	Lower frame to mudline. Advance CPT from mudline to 22.1m.
	1630	1705	Set casing to a depth of 20.0m.
	1705	1735	Advance CPT from 22.1m to 54.1m.
	1735	2010	Pull rods and casing to deck and raise frame.
	2010	2030	Pull spuds and move to a location 00C-79. Set two spuds and position barge.
	2030	2140	Rig up for sounding.
	****	2140	Measure water depth of 4.1m using bottom sensor. Current tide level is approximately +0.1m MSL. Calculate approximate mudline elevation of -4.0m MSL.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project





Date	Time		Description of Activity
	From	To	
October 5, 2000	2140	2235	Lower frame to mudline. Excessive frame pitch/roll due to sloping mudline.
	2235	2300	Move to Location 00C-78. Set two spuds and position barge.
	2300	2310	Rig up for sounding.
	****	2315	Measure water depth of 11.0m using bottom sensor. Current tide level is approximately -0.4m MSL. Calculate approximate mudline elevation of -11.4m MSL.
	2310	2345	Lower frame to mudline and advance CPT from mudline to 18.5m.
	2345	2400	Set casing to 7m.
October 6, 2000	0000	0105	Set casing to 17m.
	0105	0130	Advance CPT sounding from 18.5m to 50m.
	0130	0315	Pull rods and casing to deck and raise frame.
	0315	0335	Pull spuds and move to a location 00C-79. Set two spuds and position barge.
	****	0335	Measure water depth of 3.6m using bottom sensor. Current tide level is approximately -0.5m MSL. Calculate approximate mudline elevation of -4.1m MSL.
	0335	0440	Perform maintenance on CPT.
	0440	0455	Advance CPT sounding from mudline to 13.6m.
	0455	0550	Set casing to 12m.
	0550	0610	Advance CPT from 13.6m to 30.5m.
	0610	0700	Pull rods and casing to deck and raise frame.
	0700	0715	Await arrival of crew boat.
	0715	0830	Conclude testing. Move away from site.

**SUMMARY OF FIELD OPERATIONS**  
**CPT Soundings**  
SFOBB East Span Seismic Safety Project



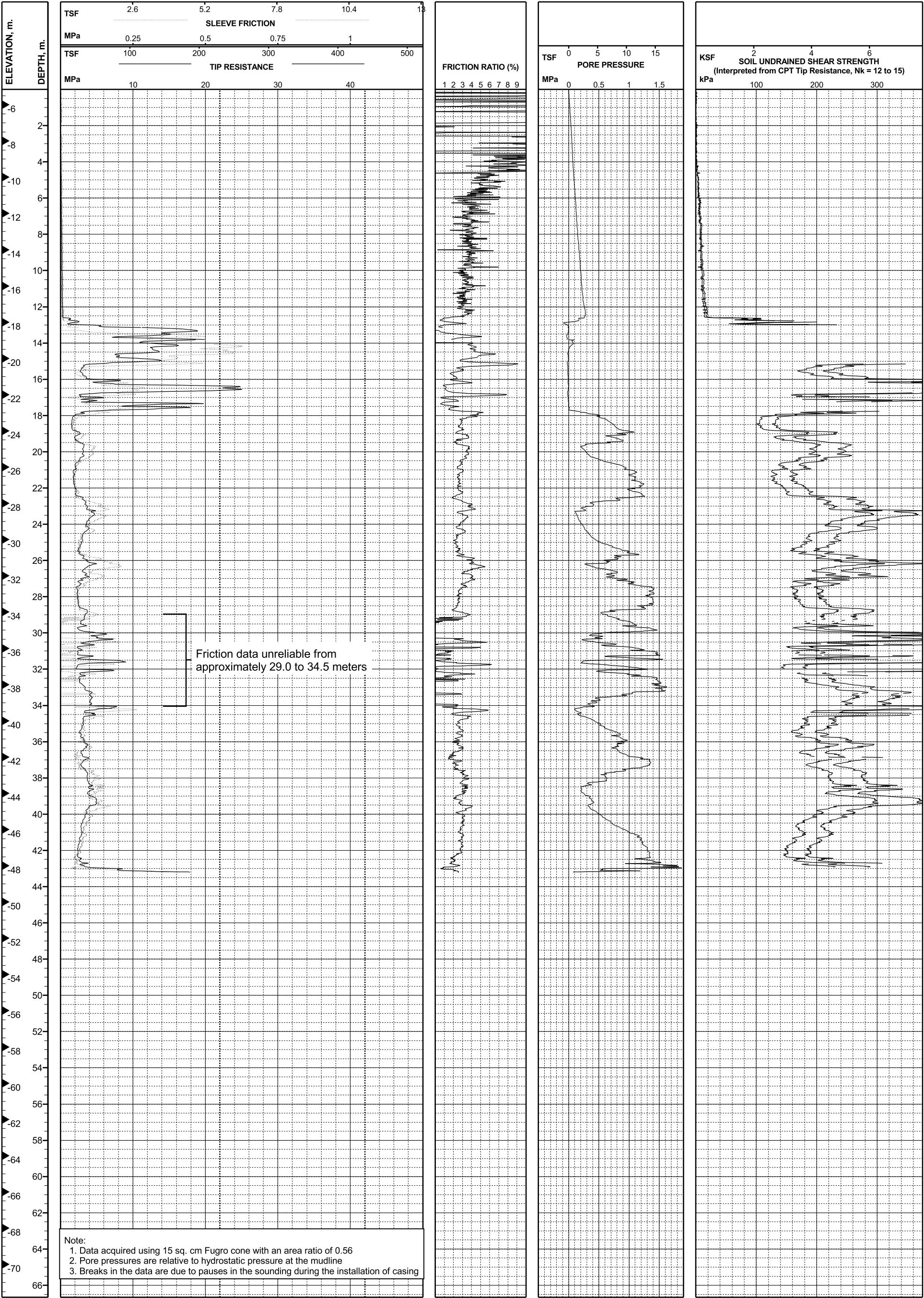
## **LOGS OF CPT SOUNDINGS**

**00C-01 through 00C-15**

**00C-17 through 00C-74**

**00C-76 through 00C-79**





KSF

2

4

6

SOIL UNDRAINED SHEAR STRENGTH

(Interpreted from CPT Tip Resistance, Nk = 12 to 15)

kPa

100

200

300

1

2

3

4

5

6

7

8

9

FRICTION RATIO (%)

Friction data unreliable from  
approximately 29.0 to 34.5 meters

Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56

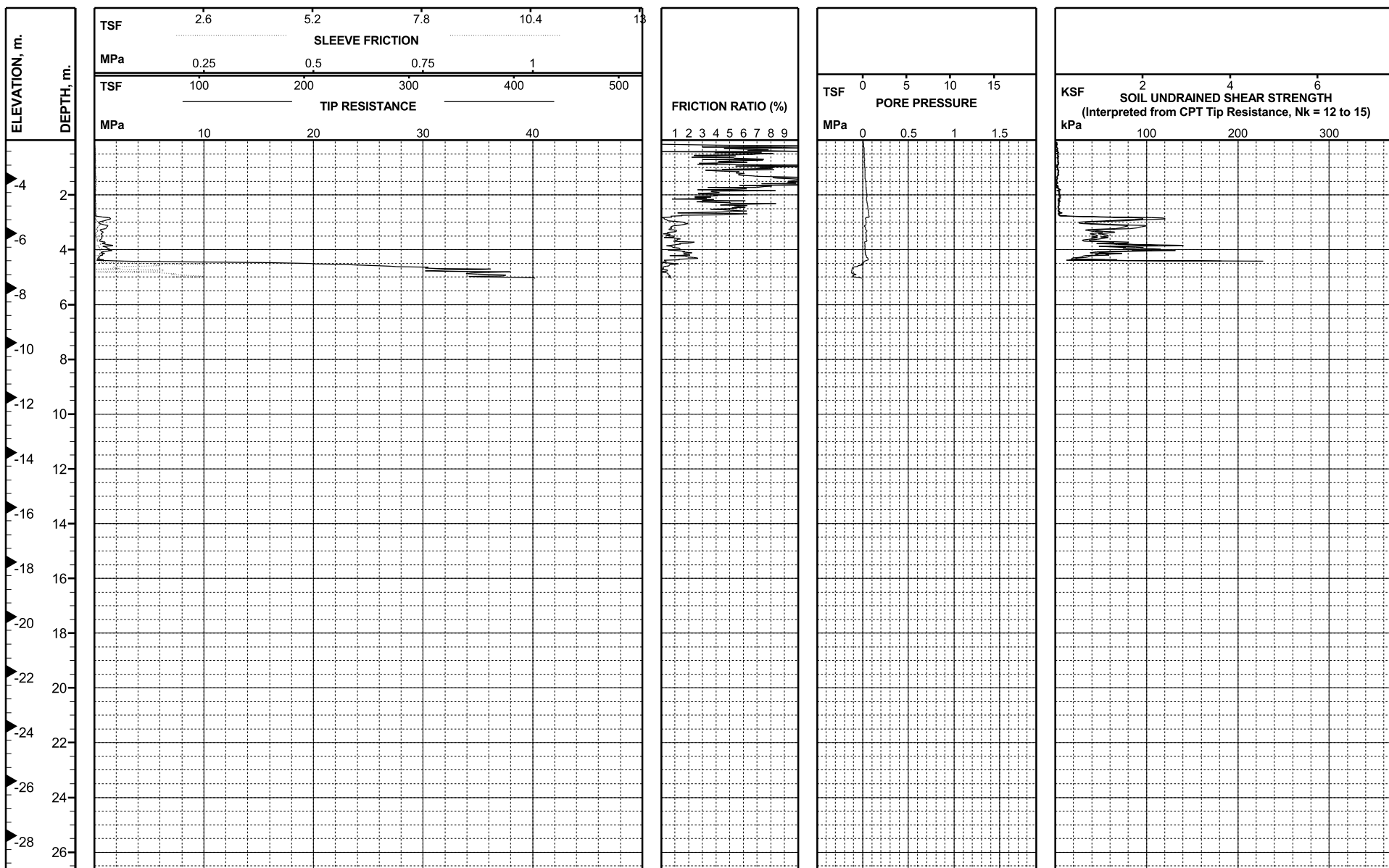
2. Pore pressures are relative to hydrostatic pressure at the mudline

3. Breaks in the data are due to pauses in the sounding during the installation of casing

PROJECT NO: 98-42-0059  
SOUNDING: 00C-02 (220 m Left of "W" Stn. 54+00)

COORDINATES: E1835882 N647495 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -2.6 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/26/00



Note:

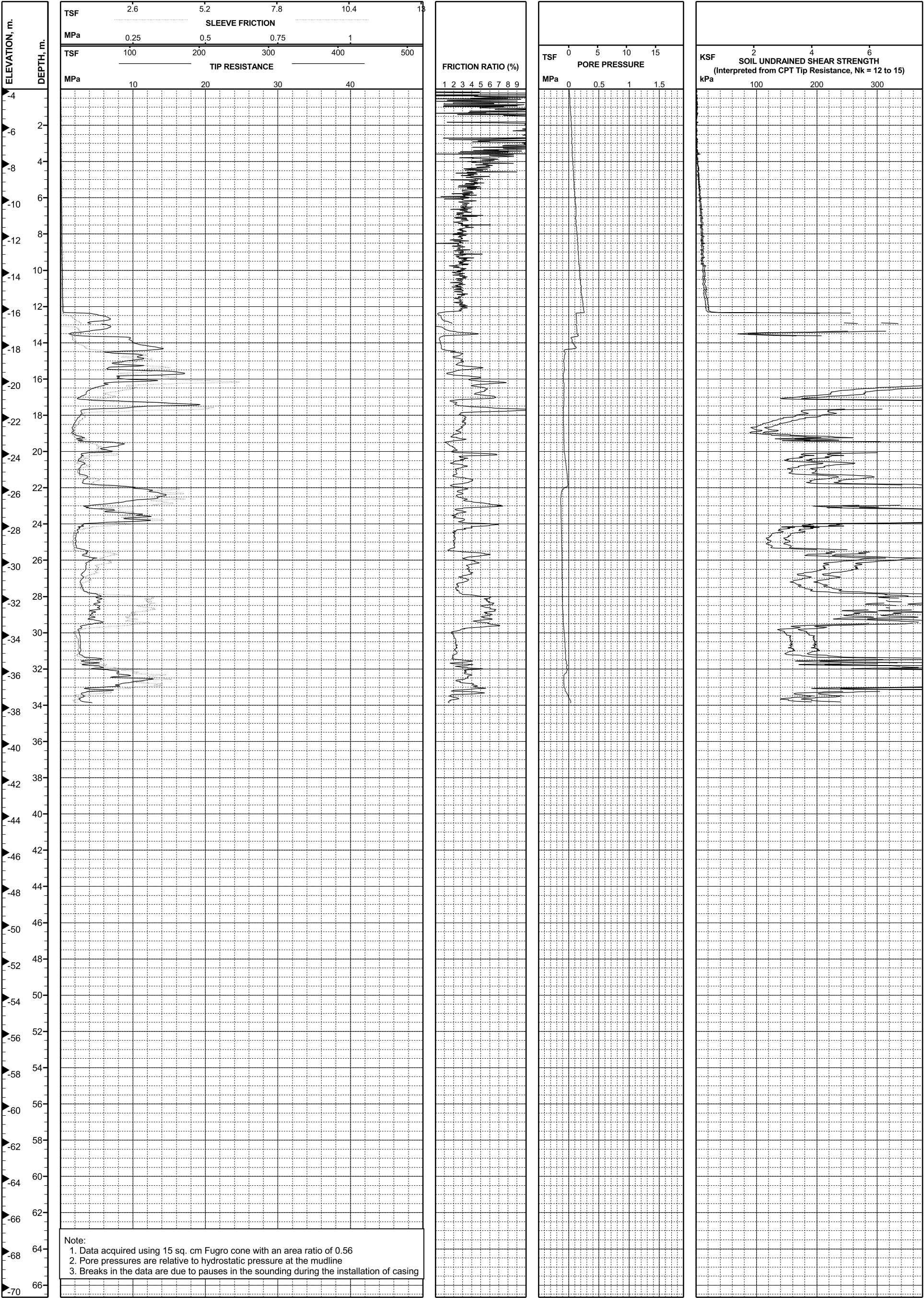
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-02

SFOBB East Span Seismic Safety Project

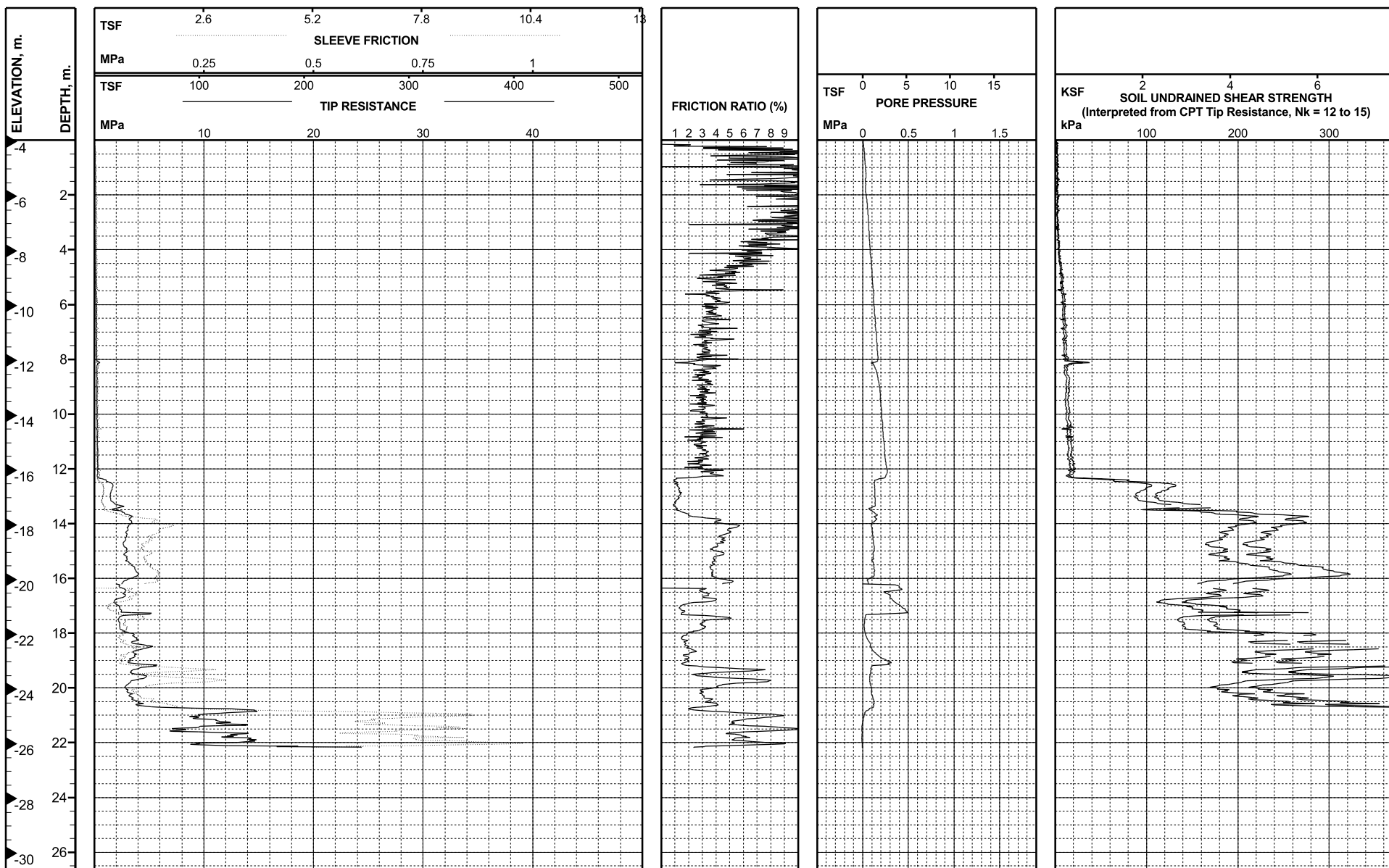




PROJECT NO: 98-42-0059  
SOUNDING: 00C-04 (159 m Left of "W" Stn. 55+00)

COORDINATES: E1836015 N647547 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -4.0 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/27/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-04

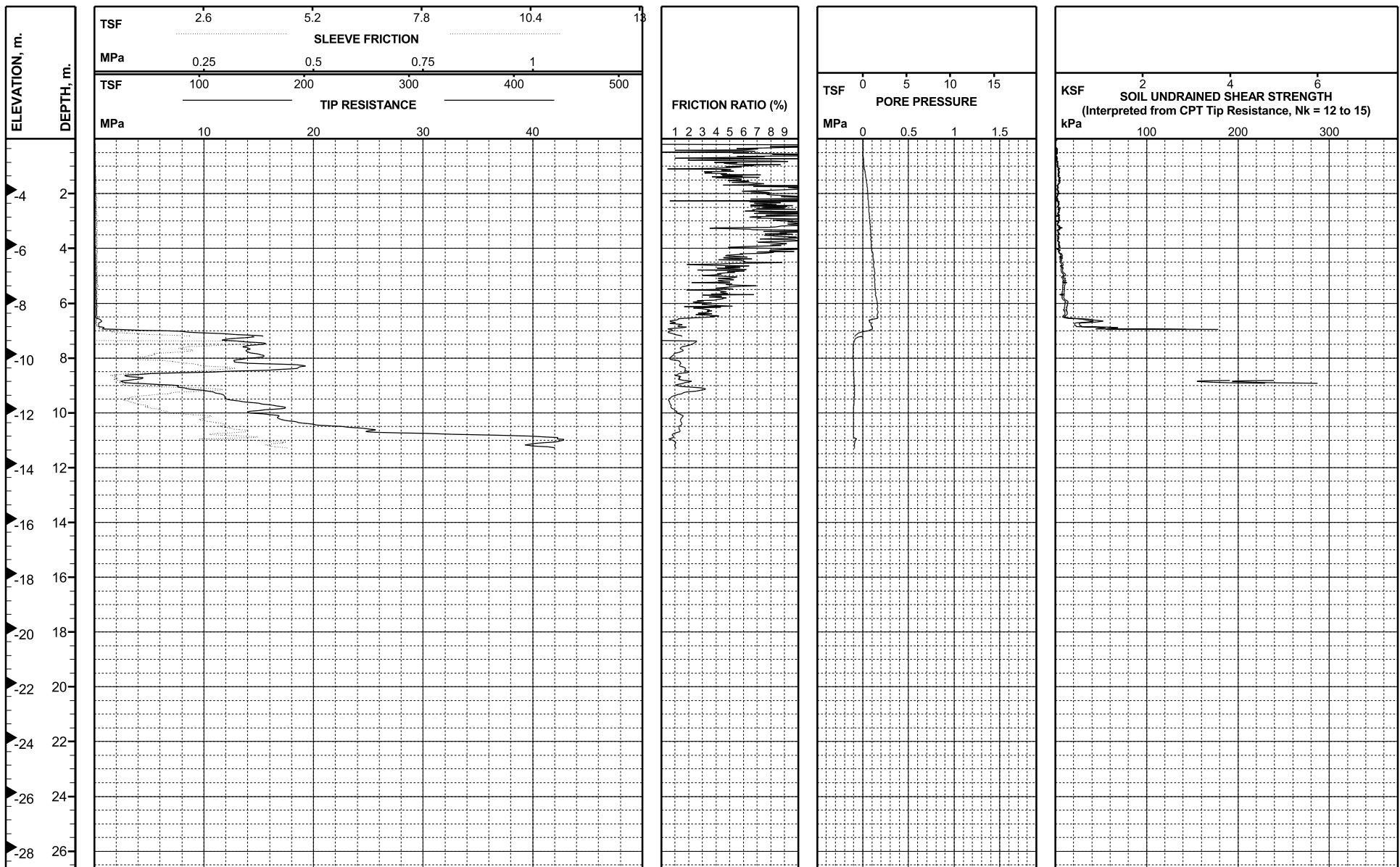
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-05 (154 m Right of "E" Stn. 54+20)

COORDINATES: E1836197 N647245 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -2.1 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/05/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-05

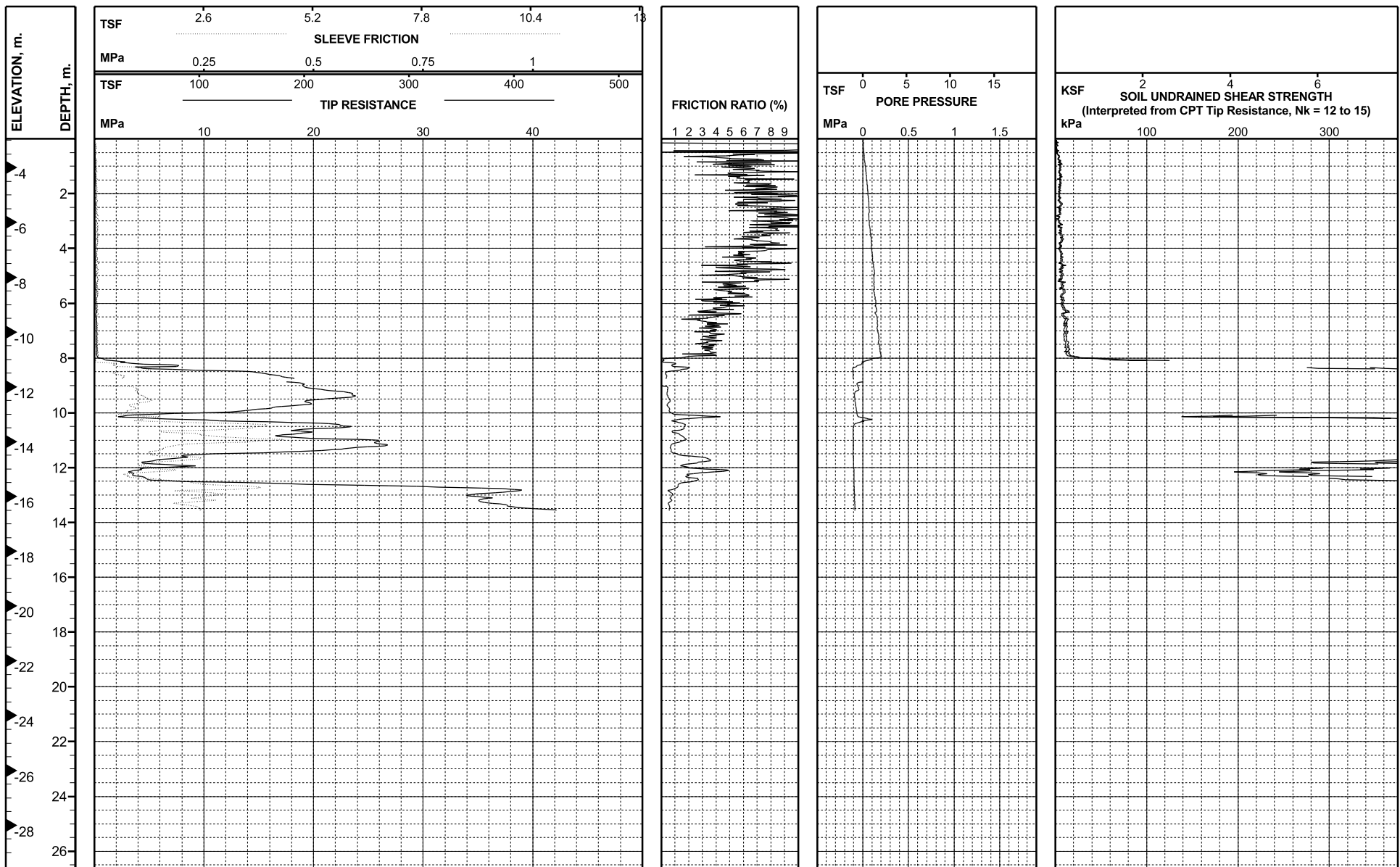
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-06 (205 m Right of "E" Stn. 54+60)

COORDINATES: E1836248 N647222 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -2.9 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/05/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-06

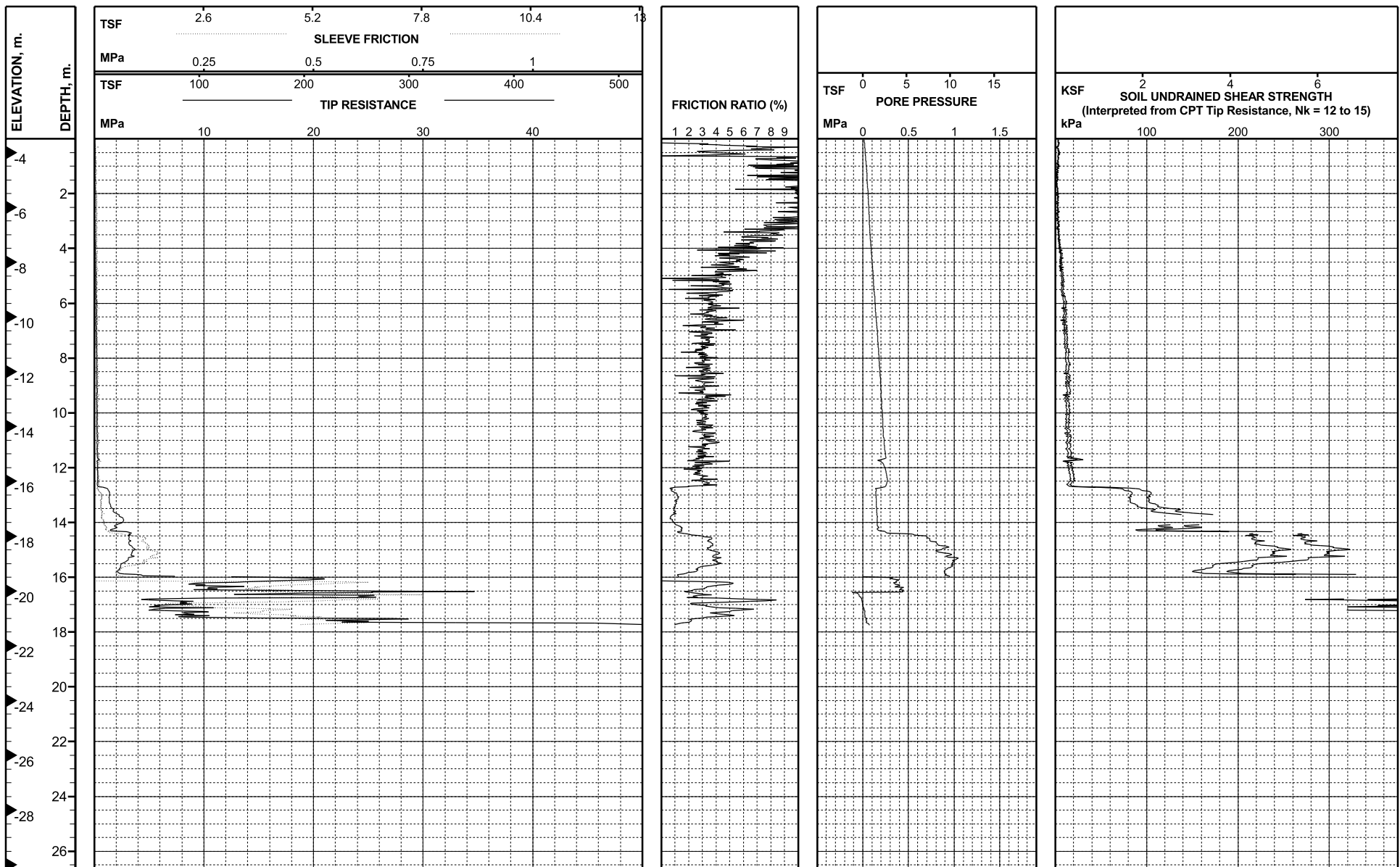
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-07 (128 m Left of "W" Stn. 55+39)

COORDINATES: E1836072 N647557 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -3.5 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/26/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

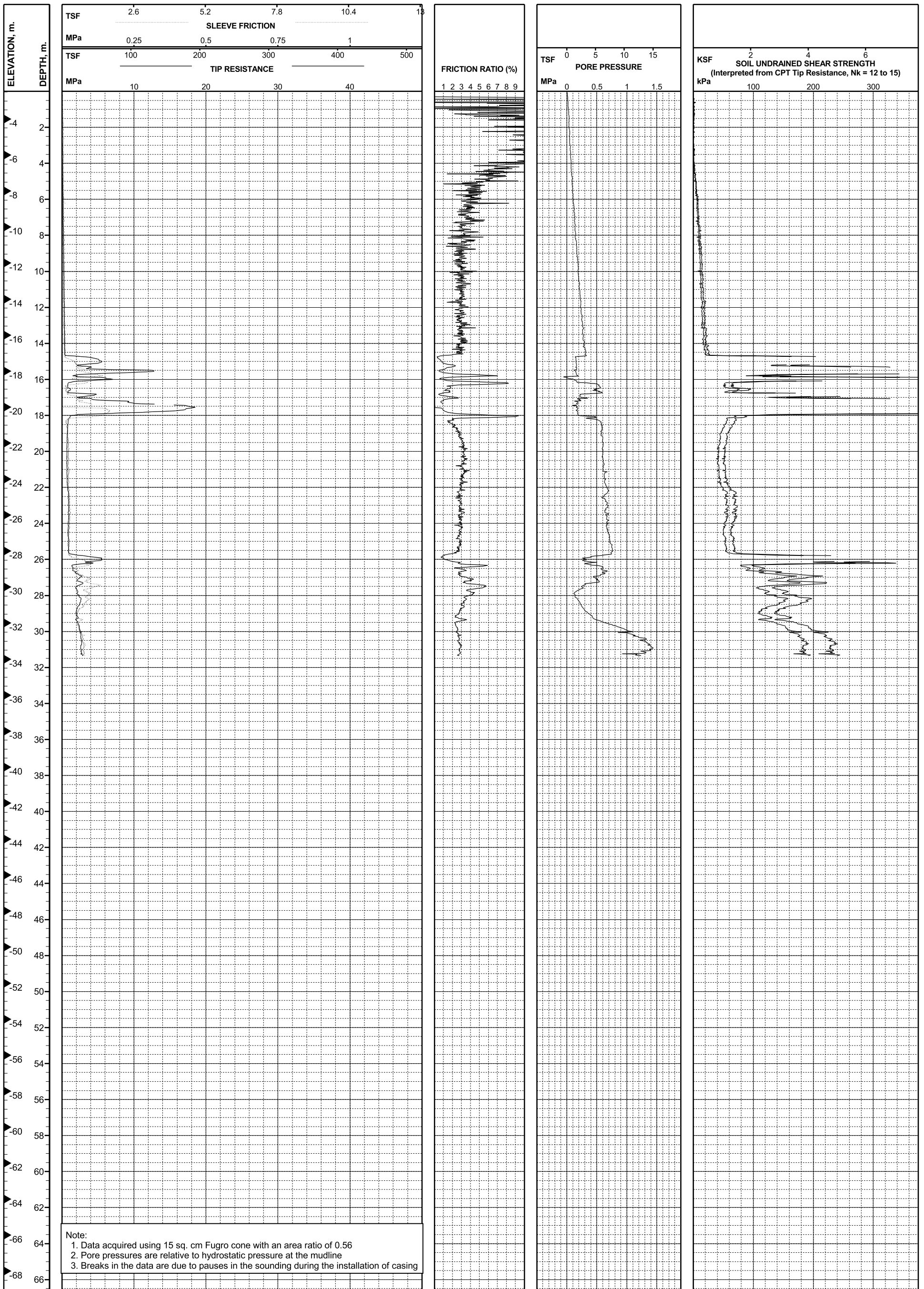
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-07

SFOBB East Span Seismic Safety Project



**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/27/00

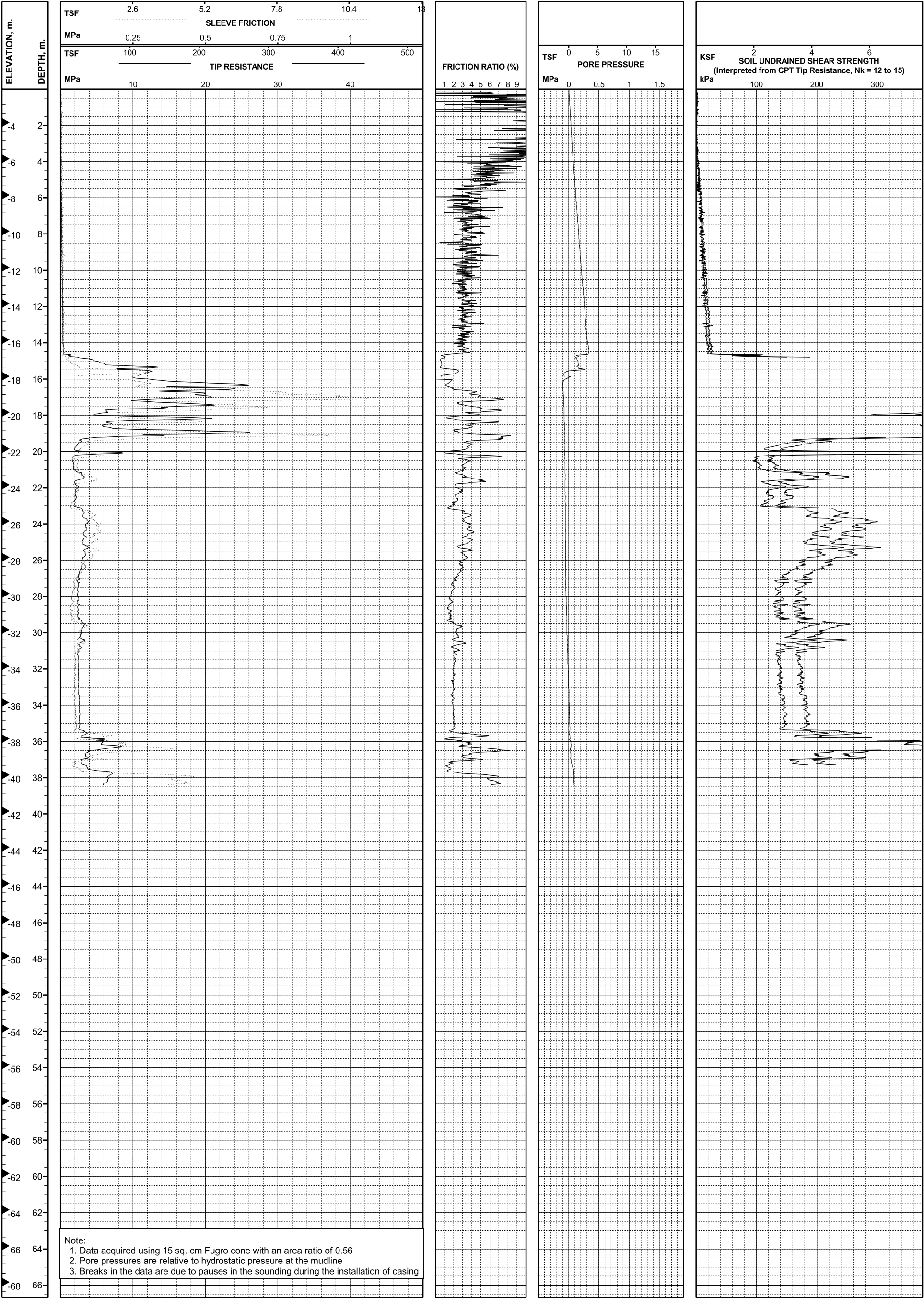


# LOG OF CPT SOUNDING 00C-08

SFOBB East Span Seismic Safety Project



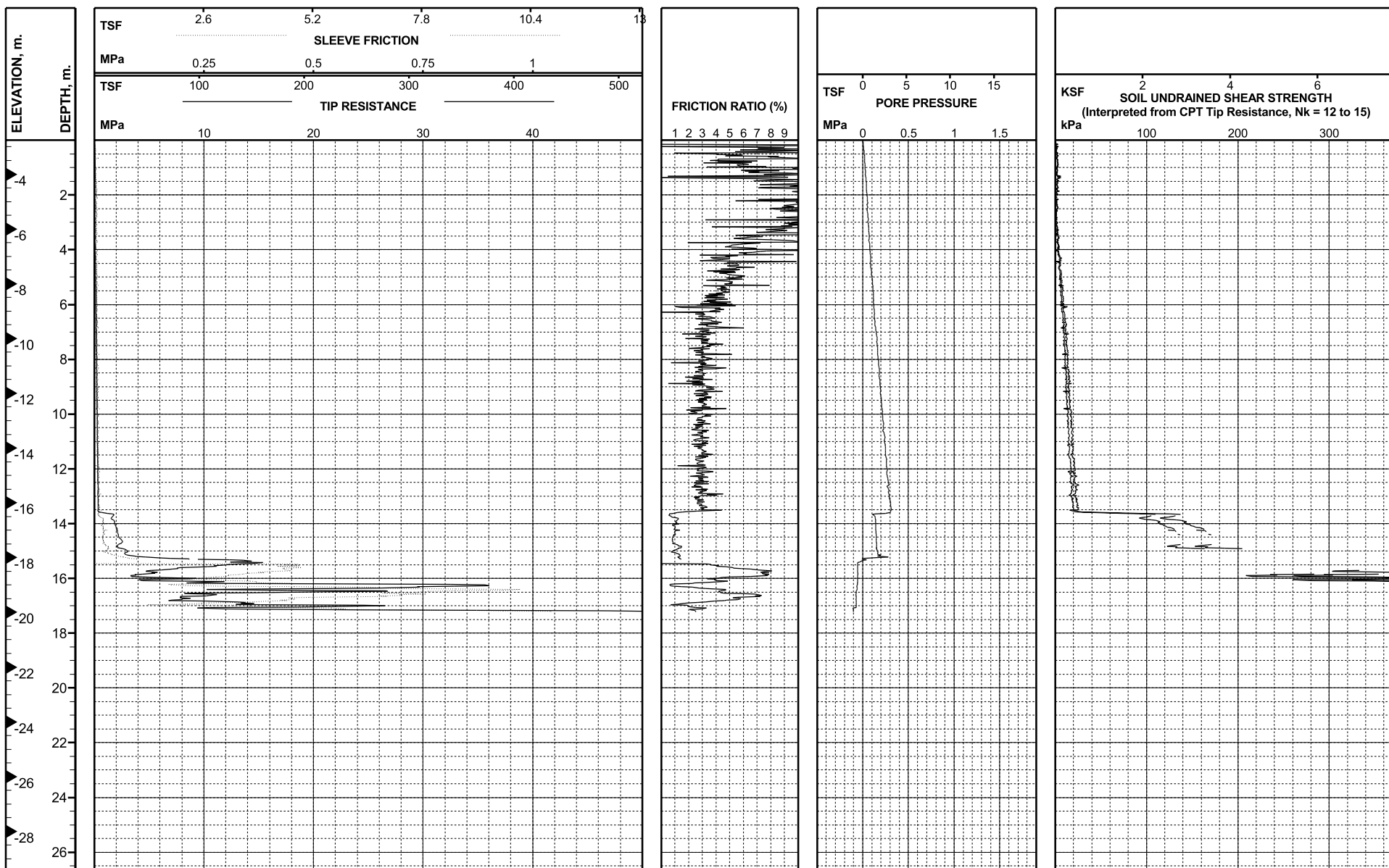




PROJECT NO: 98-42-0059  
SOUNDING: 00C-10 (103 m Left of "W" Stn. 56+39)

COORDINATES: E1836169 N647596 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -2.8 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/27/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing

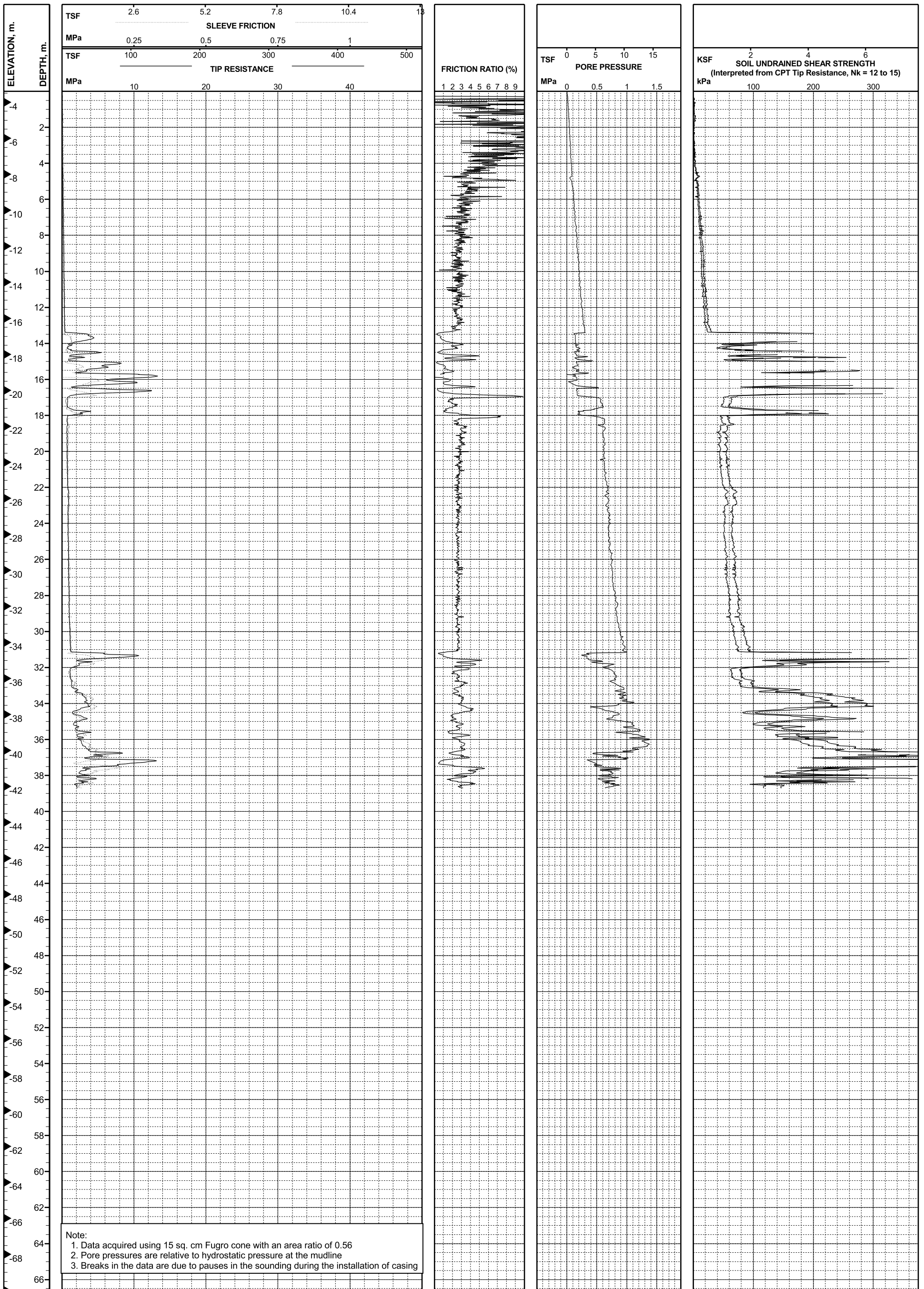
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-10

SFOBB East Span Seismic Safety Project



**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/28/00

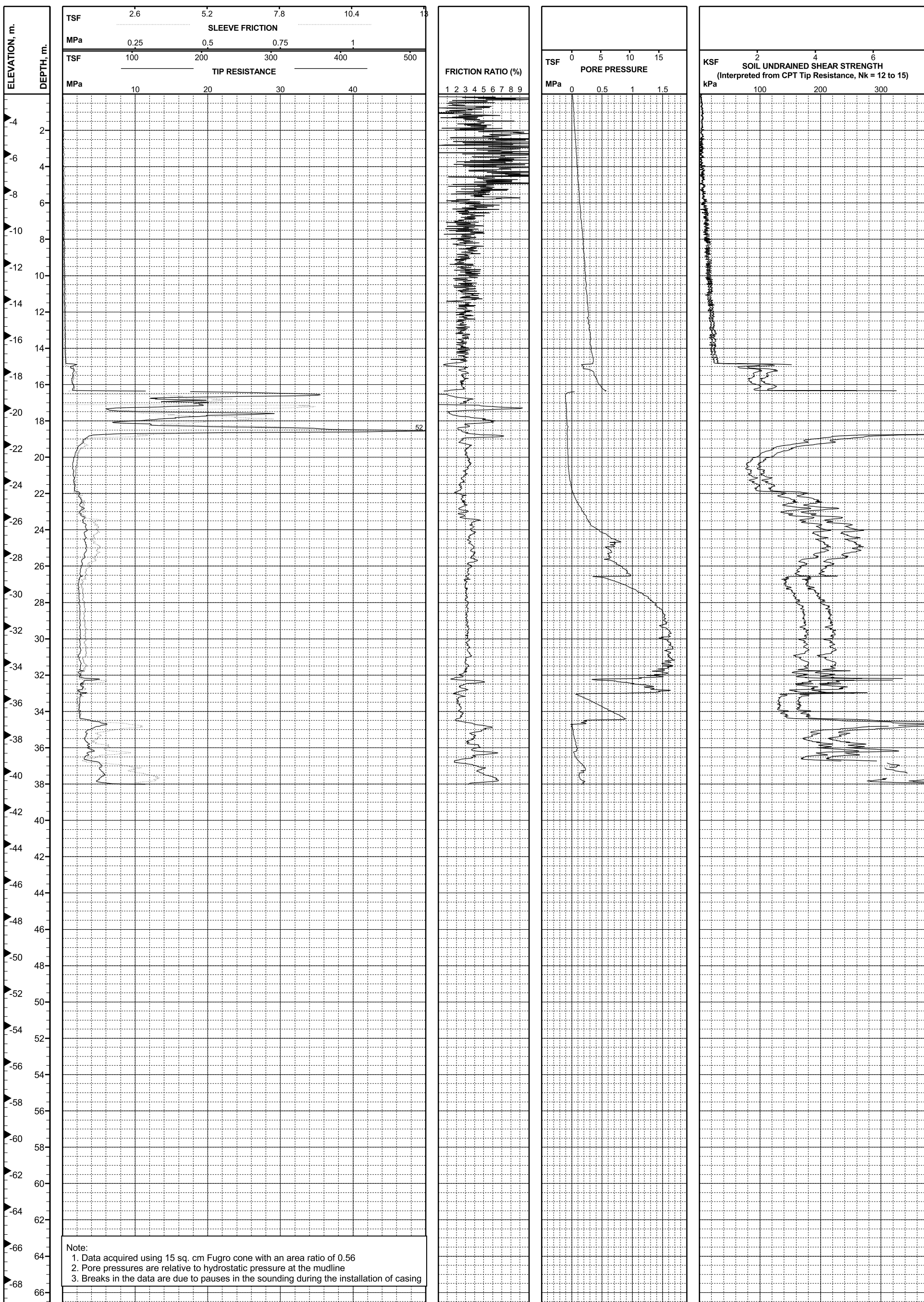


# LOG OF CPT SOUNDING 00C-11

SFOBB East Span Seismic Safety Project



**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/26/00



# LOG OF CPT SOUNDING 00C-12

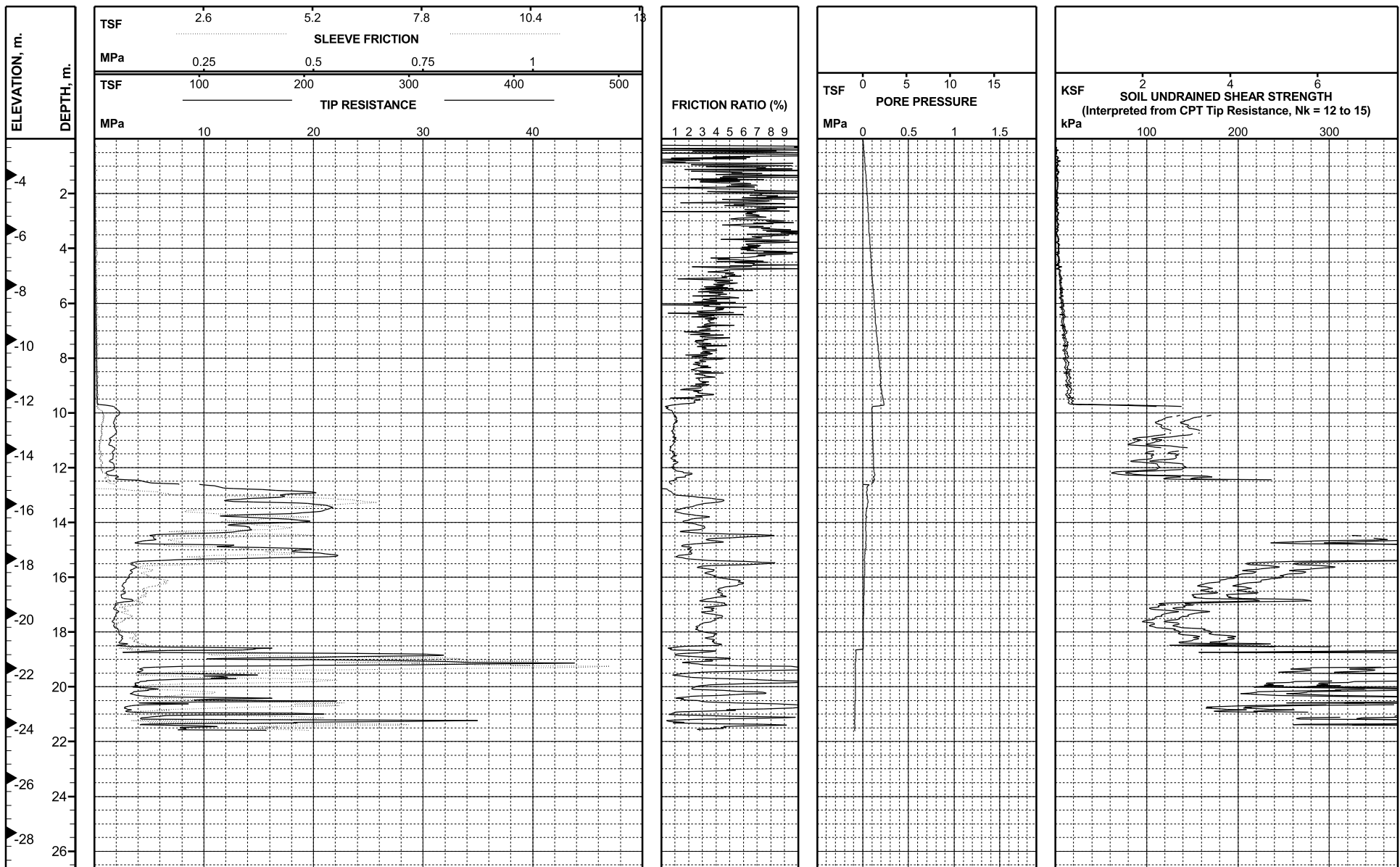
# SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-13 (77 m Left of "W" Stn. 57+00)

COORDINATES: E1836259 N647632 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -2.7 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/28/00

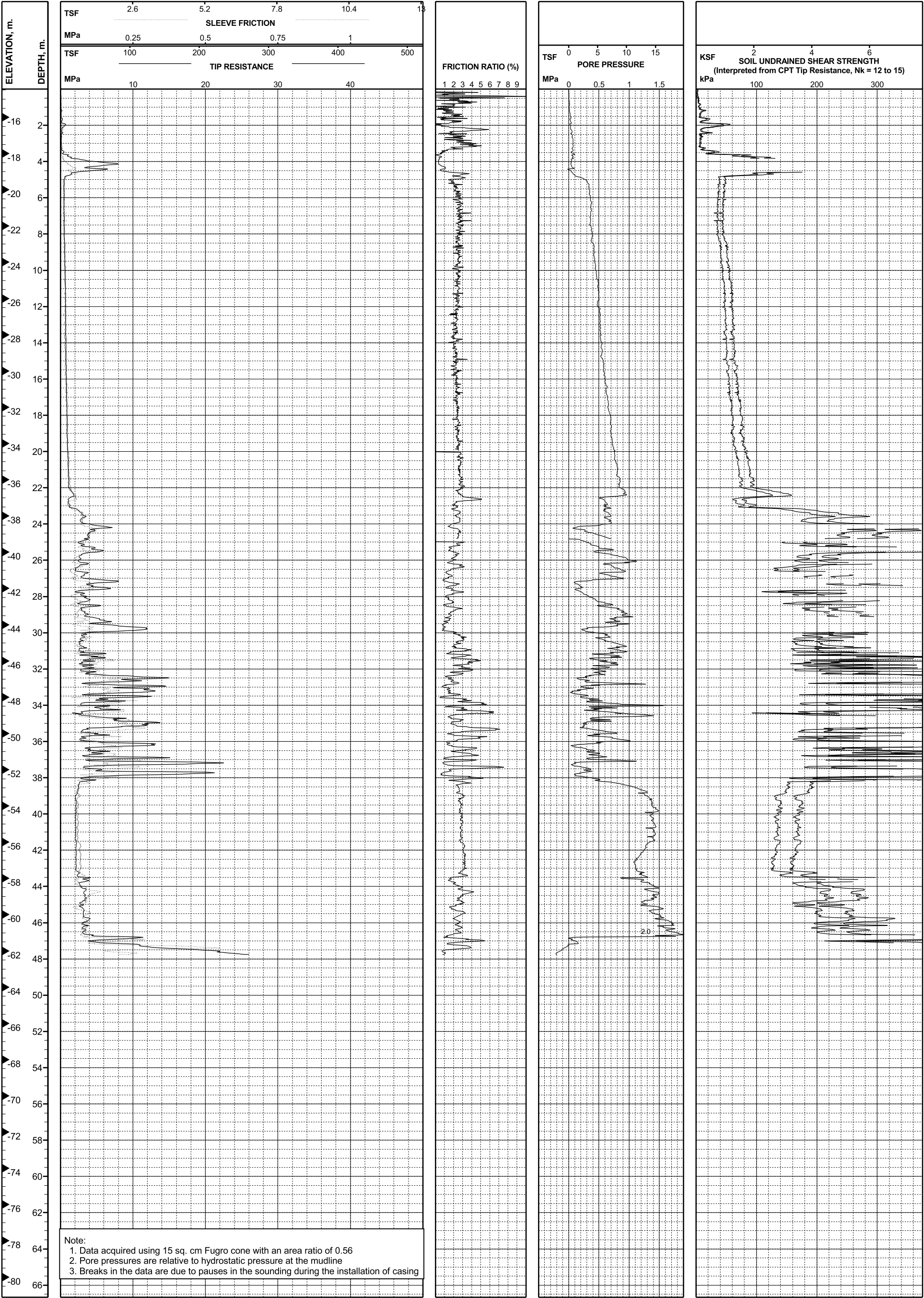


Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-13

SFOBB East Span Seismic Safety Project

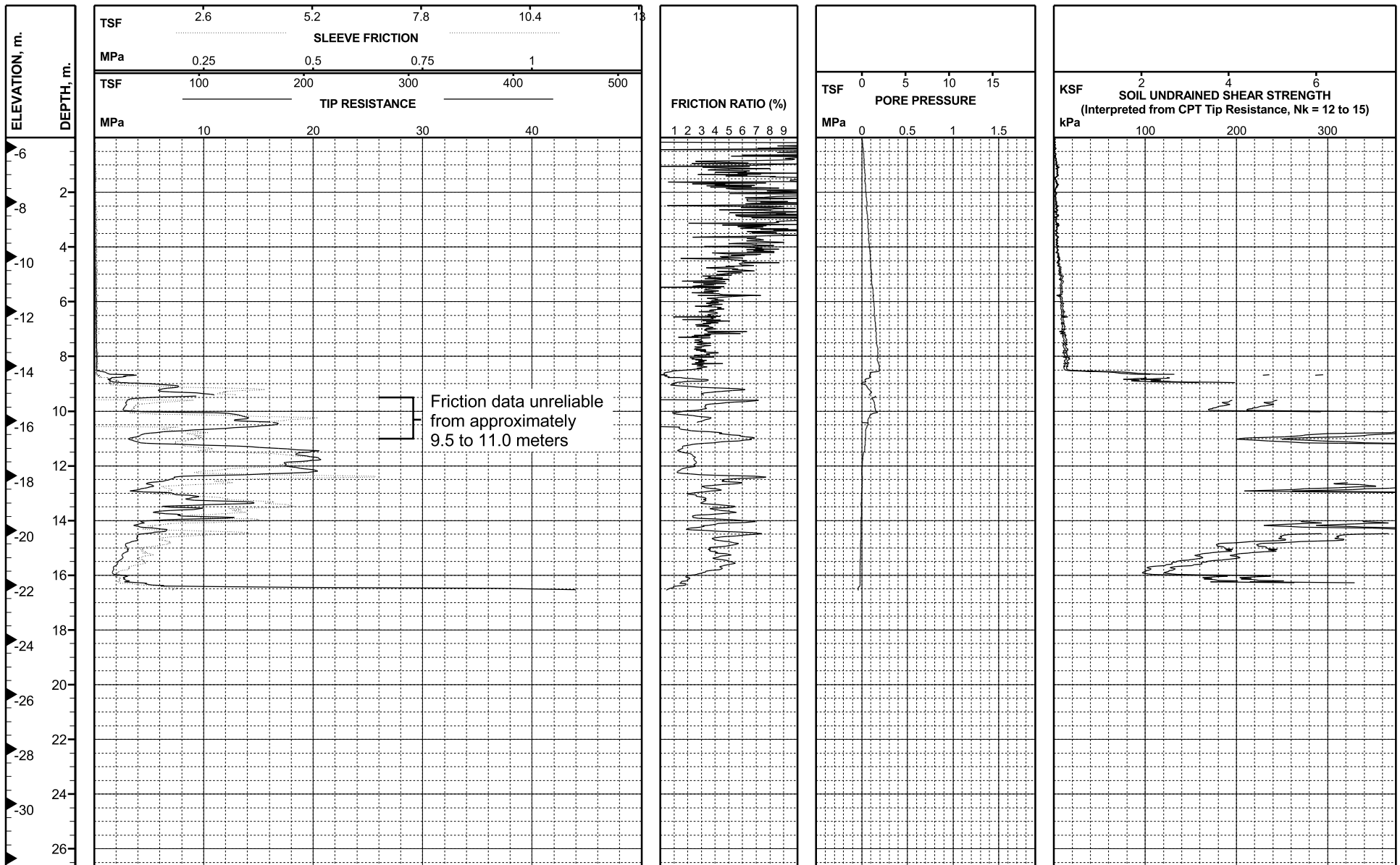




PROJECT NO: 98-42-0059  
SOUNDING: 00C-15 (67 m Left of "W" Stn. 57+60)

COORDINATES: E1836312 N647656 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -5.6 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/28/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-15

SFOBB East Span Seismic Safety Project

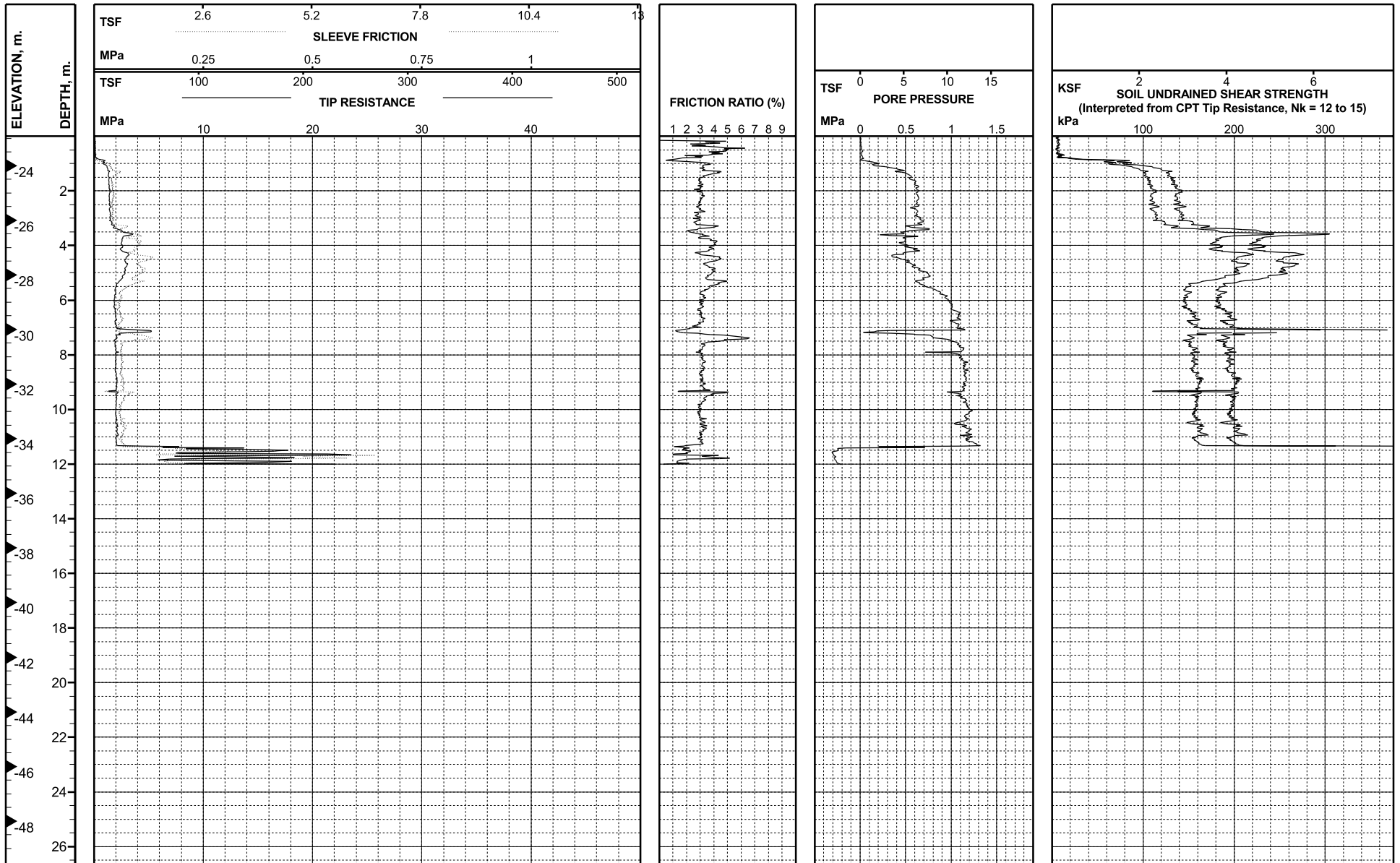




PROJECT NO: 98-42-0059  
SOUNDING: 00C-17 (31 m Left of "W" Stn. 58+60)

COORDINATES: E1836408 N647678 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -22.9 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/28/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

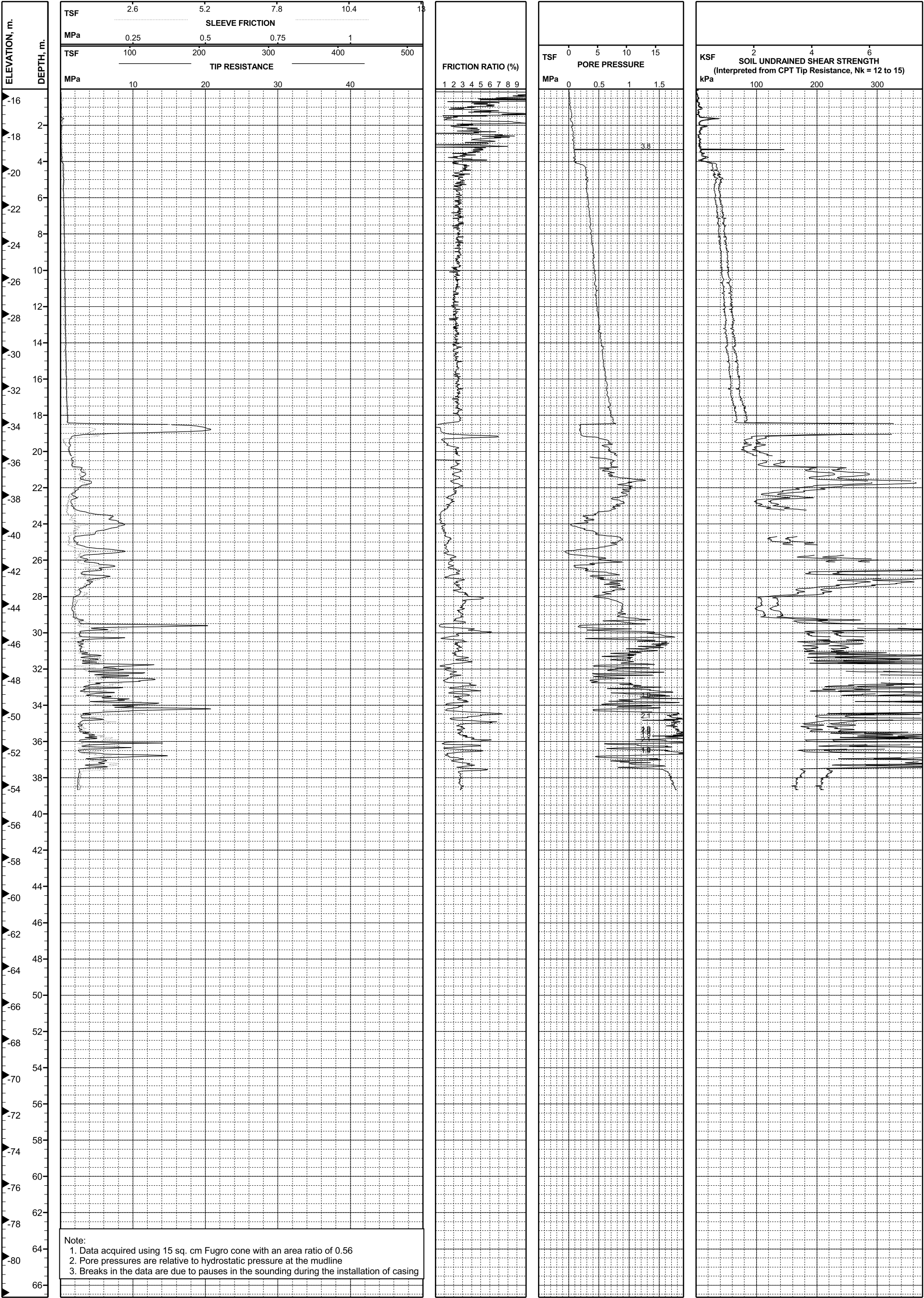
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-17

SFOBB East Span Seismic Safety Project



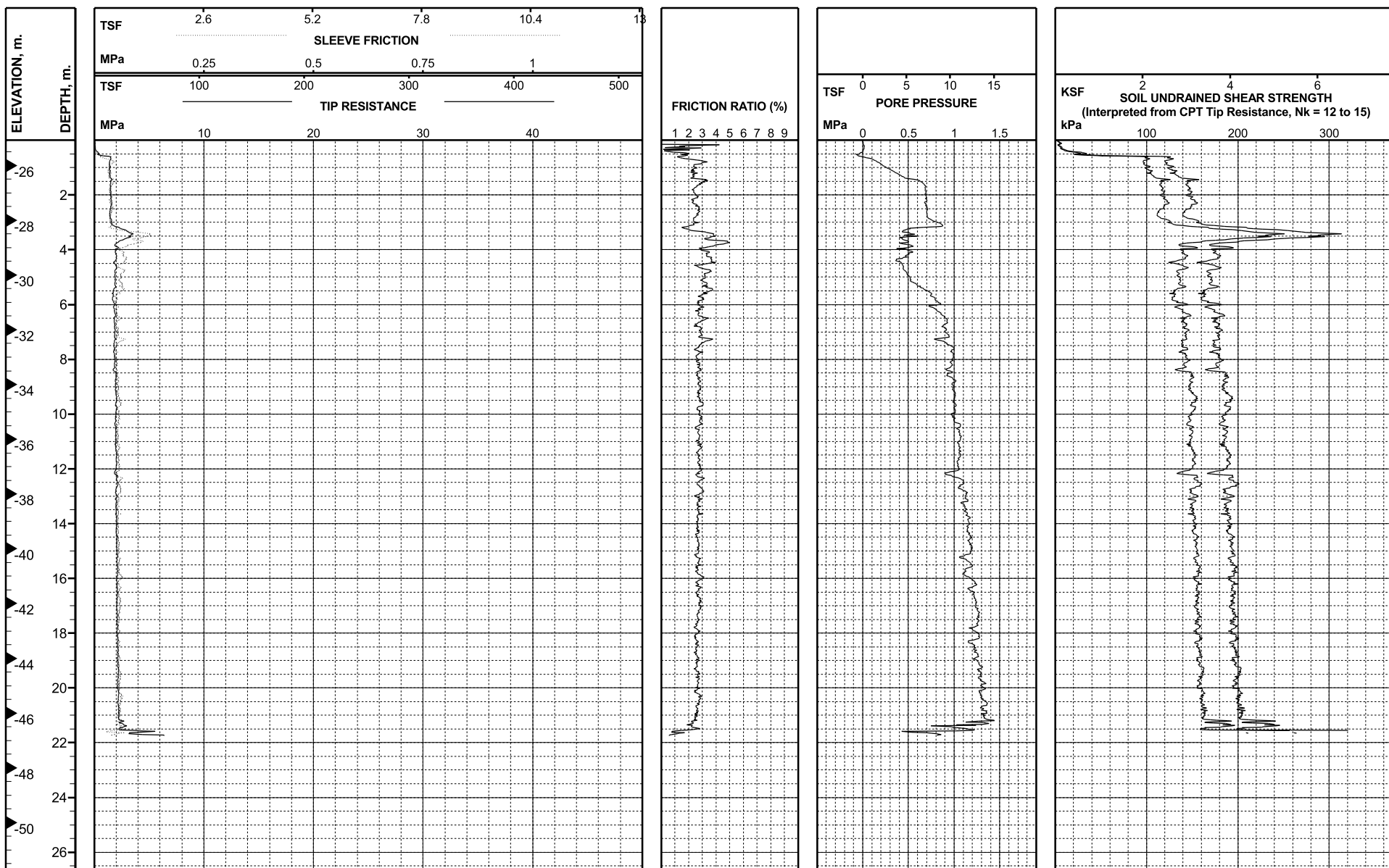




PROJECT NO: 98-42-0059  
SOUNDING: 00C-19 (2 m Left of "W" Stn. 59+20)

COORDINATES: E1836472 N647684 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -25.1 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/30/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-19

SFOBB East Span Seismic Safety Project

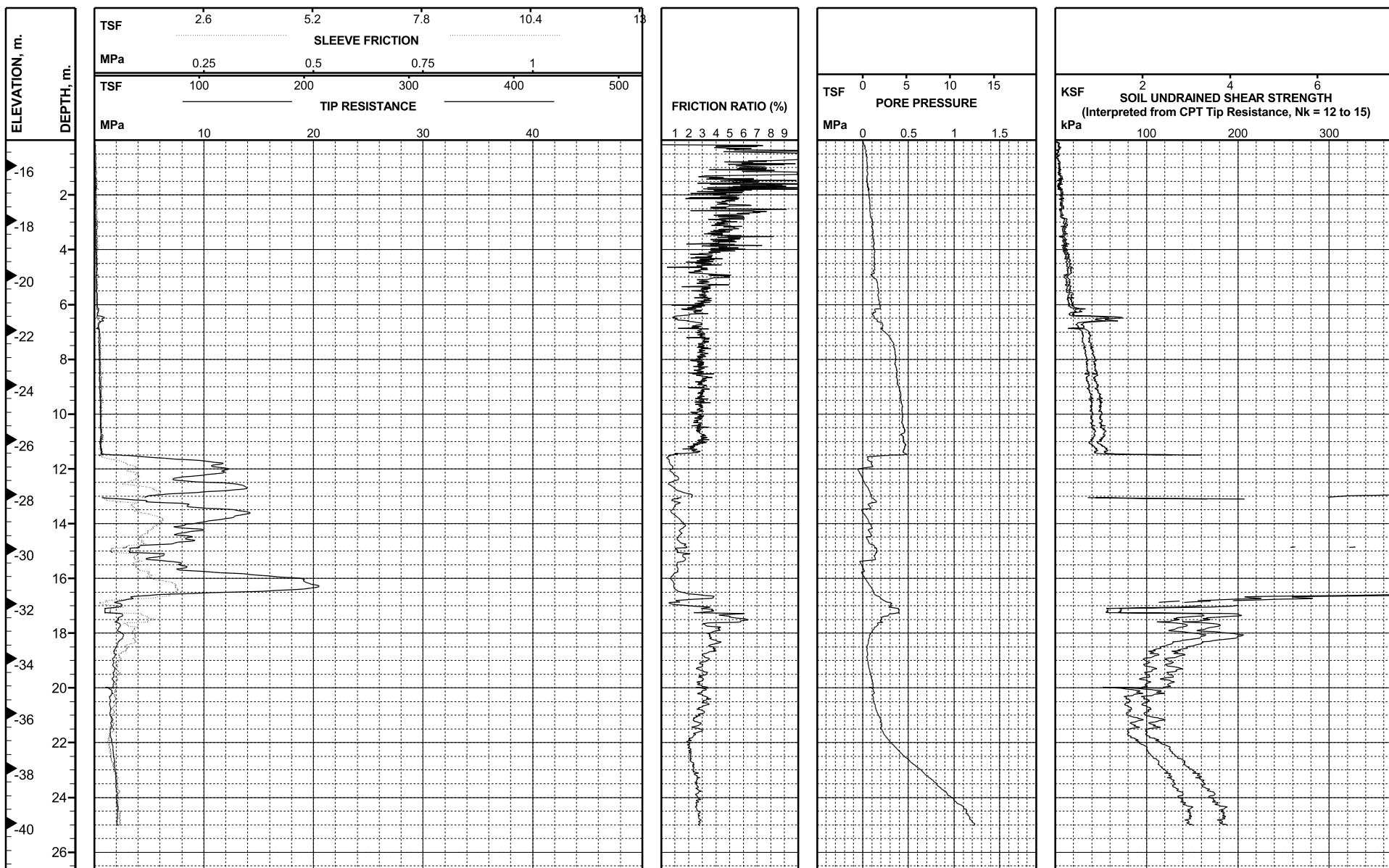




PROJECT NO: 98-42-0059  
SOUNDING: 00C-21 (221 m Left of "W" Stn. 61+00)

COORDINATES: E1836467 N647943 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -15.1 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/27/00



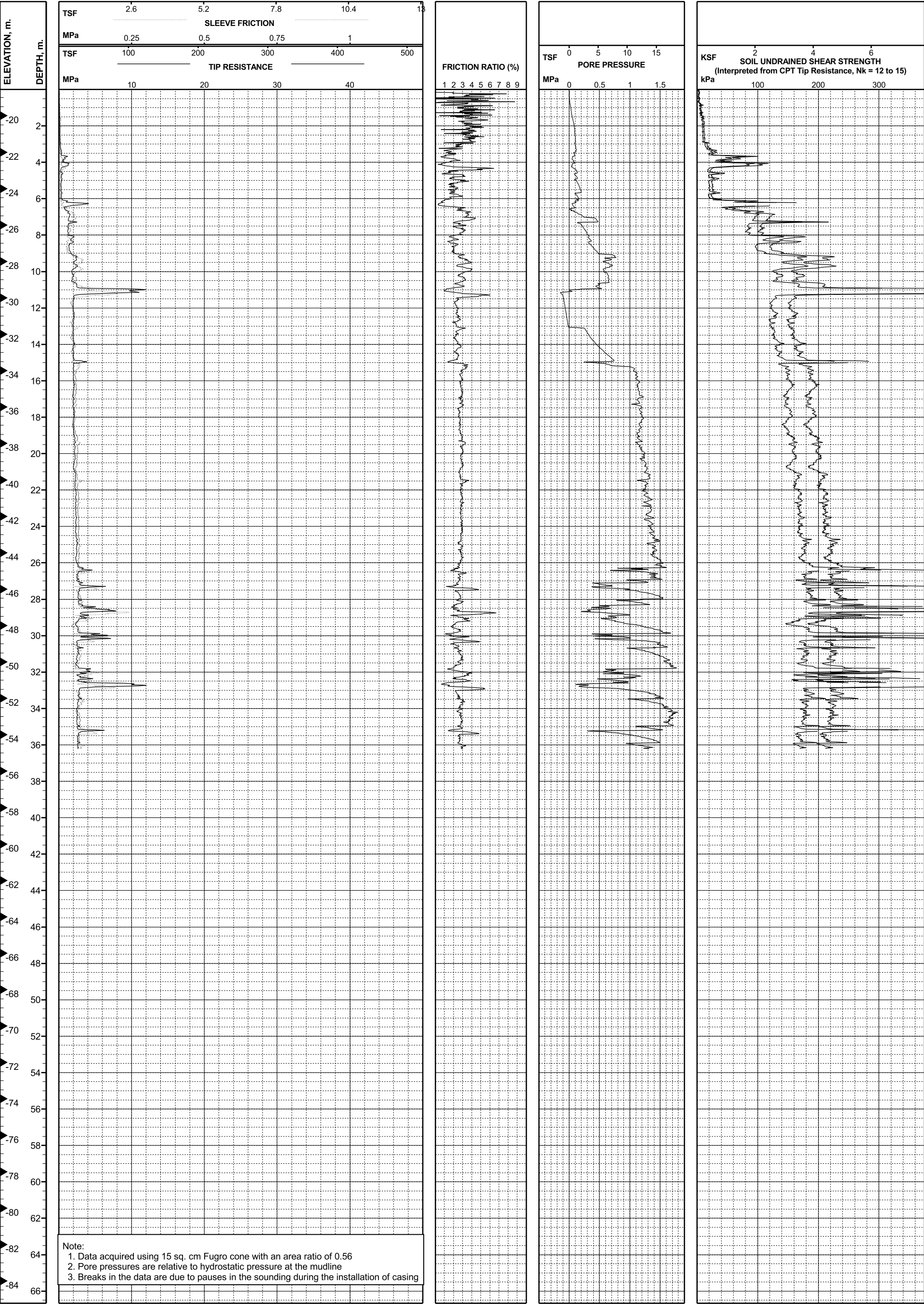
Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-21

SFOBB East Span Seismic Safety Project



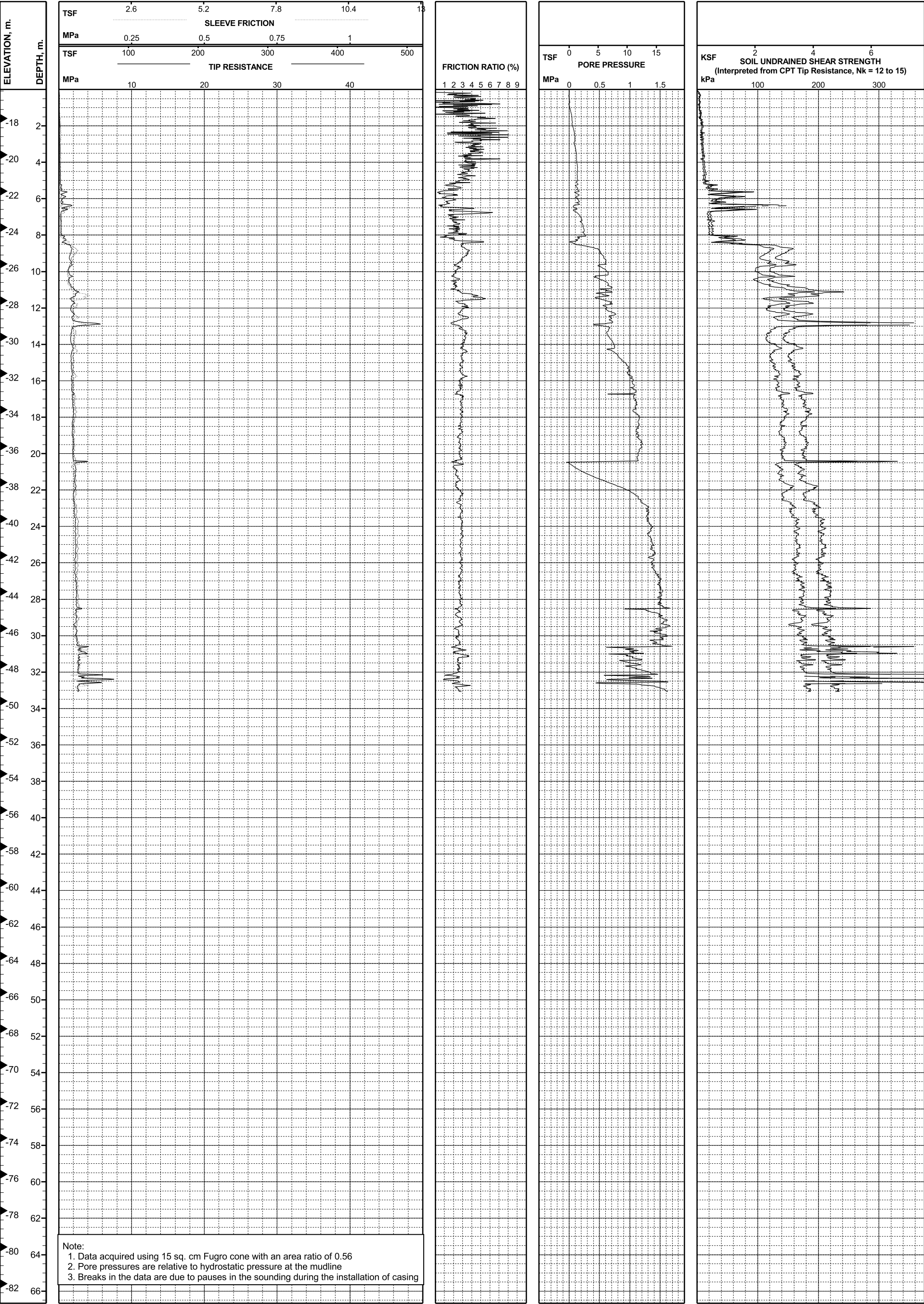
**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/30/00



# SFOBB East Span Seismic Safety Project

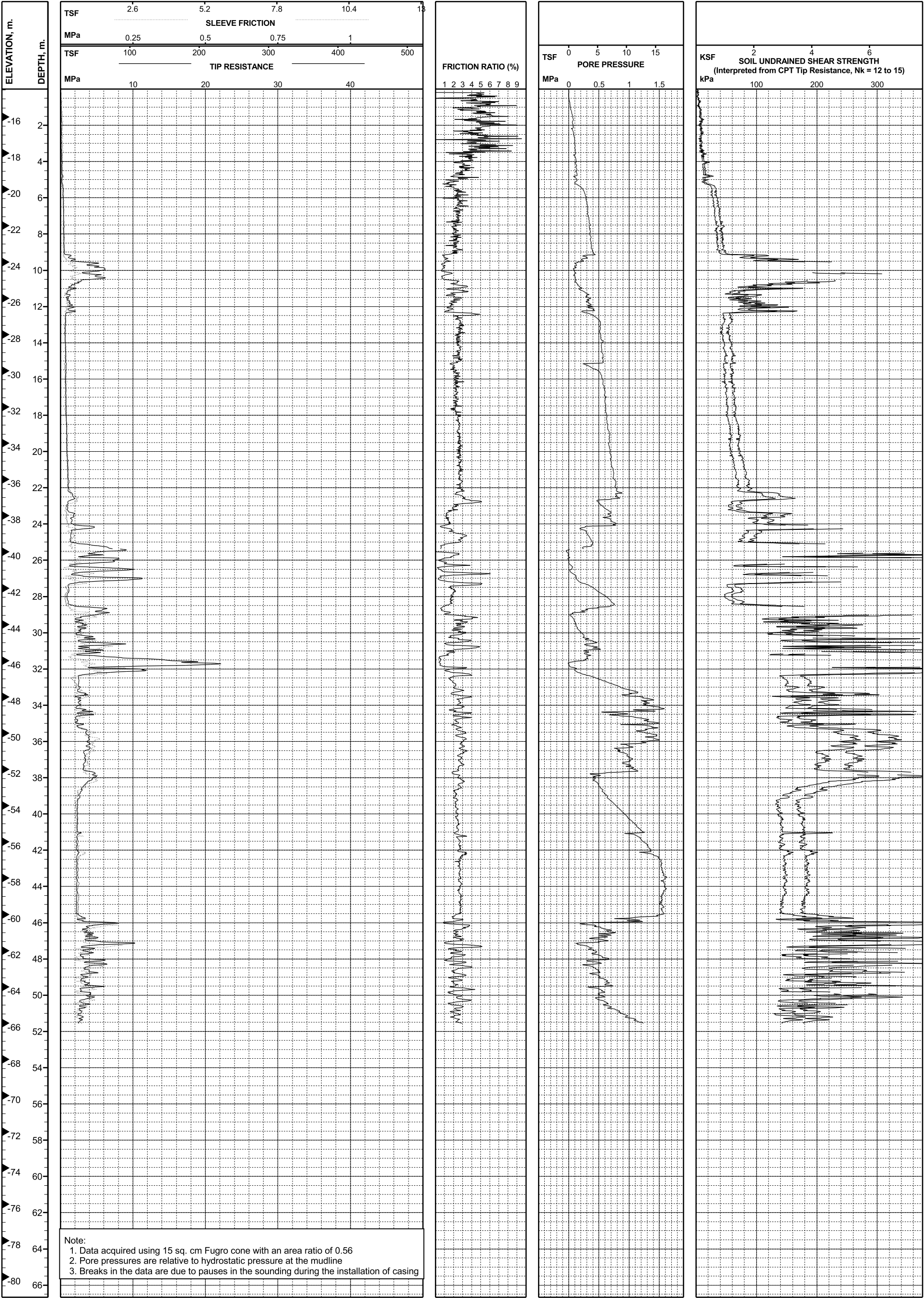


**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/30/00

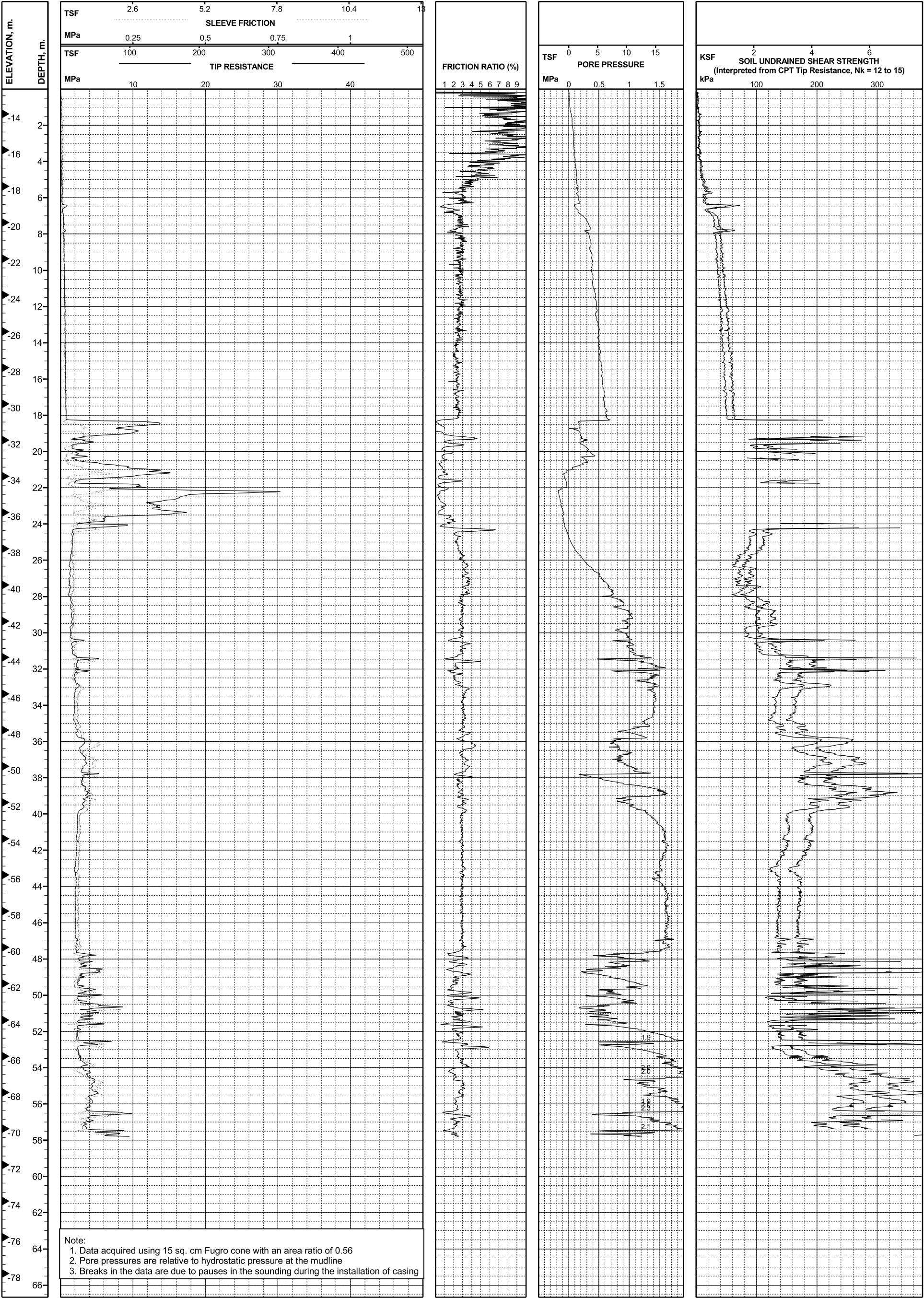


# SFOBB East Span Seismic Safety Project

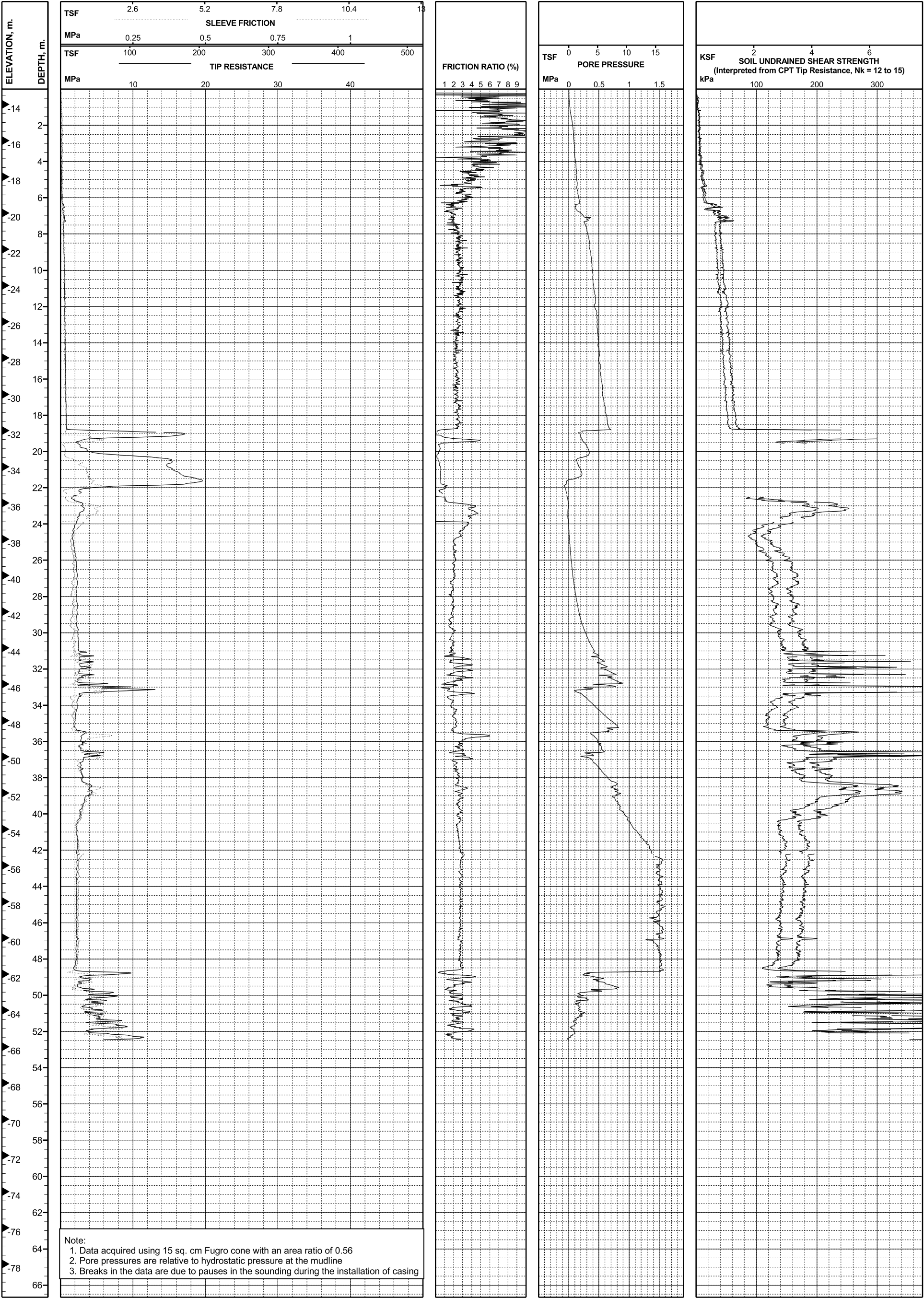


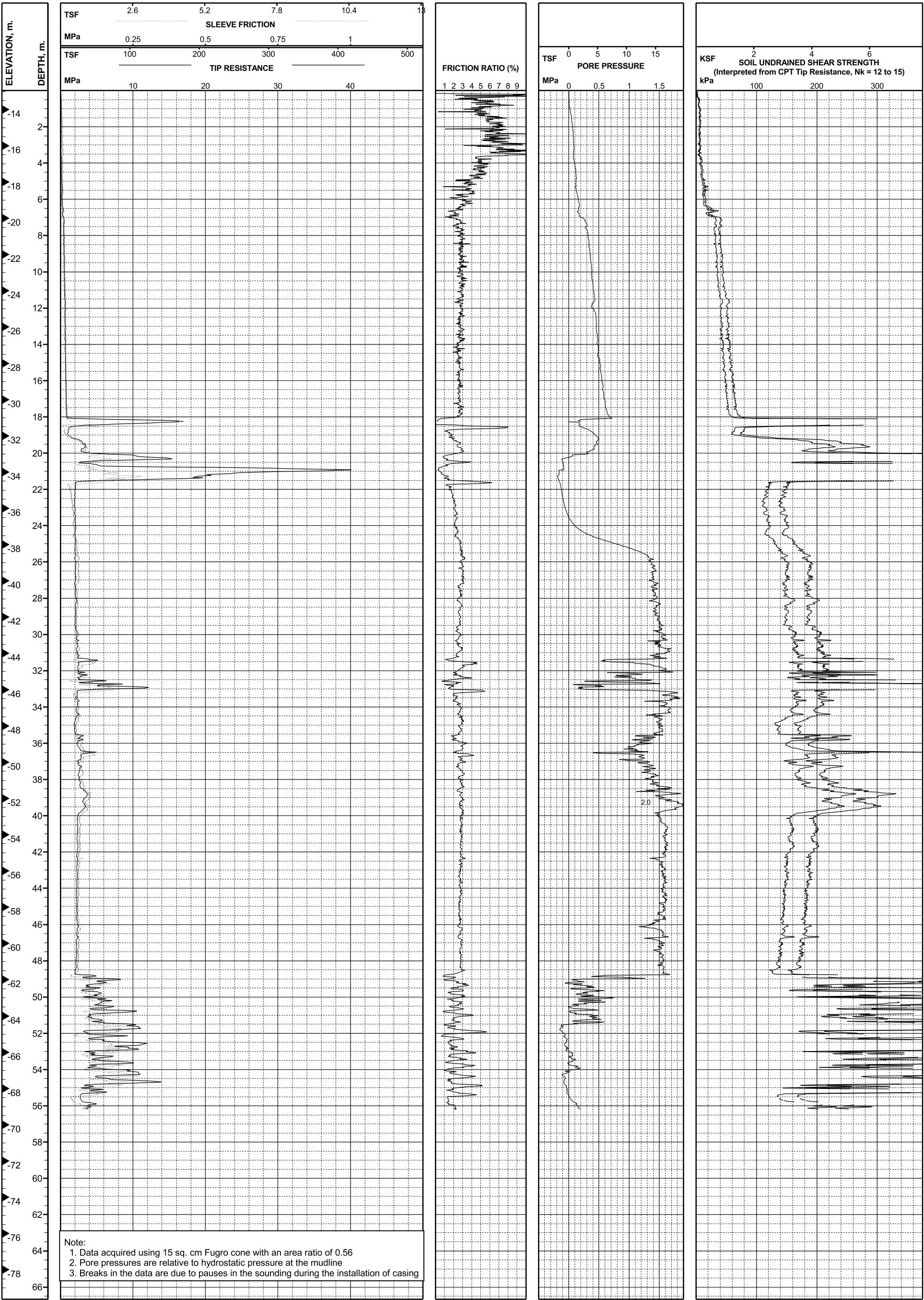


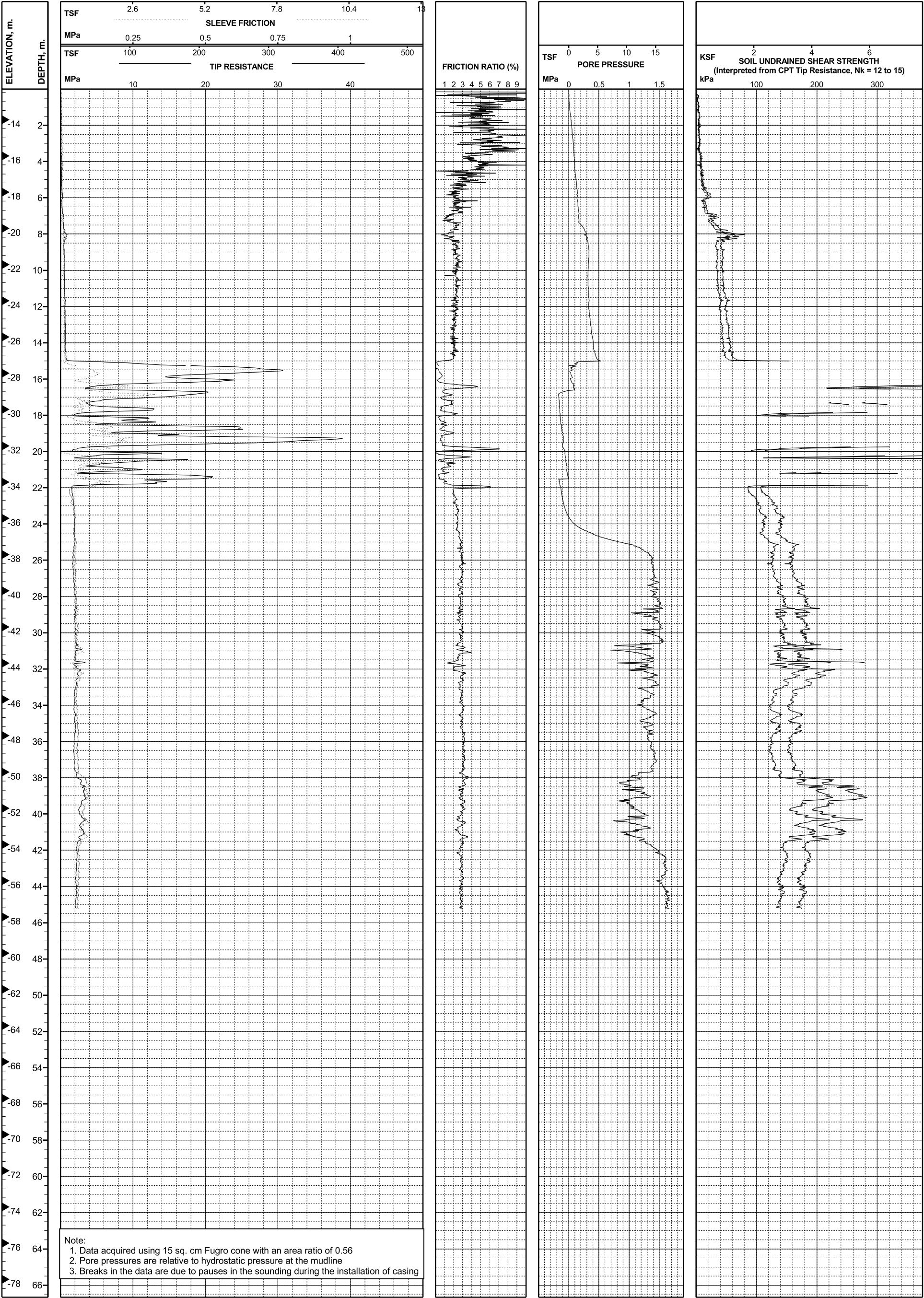


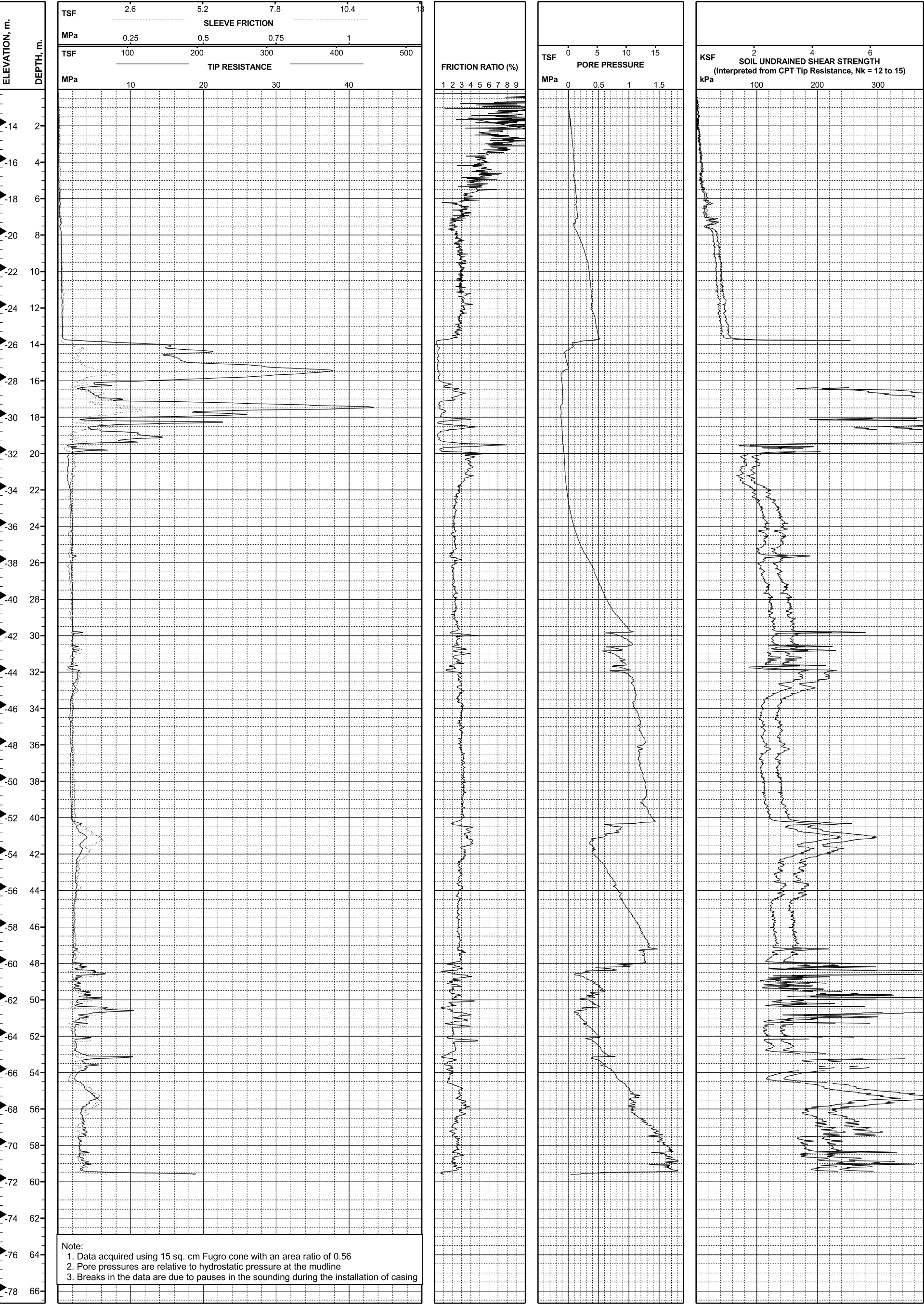


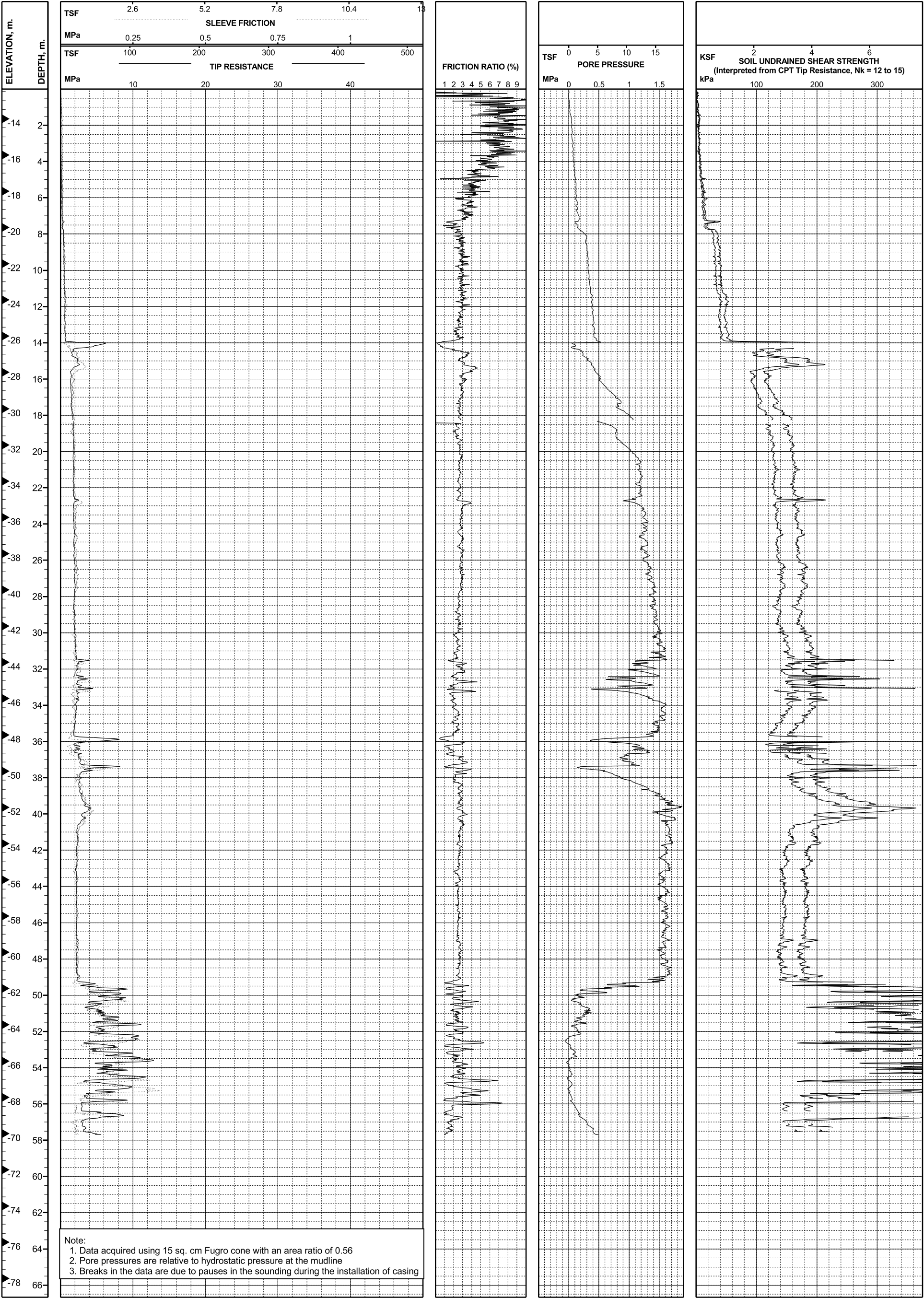




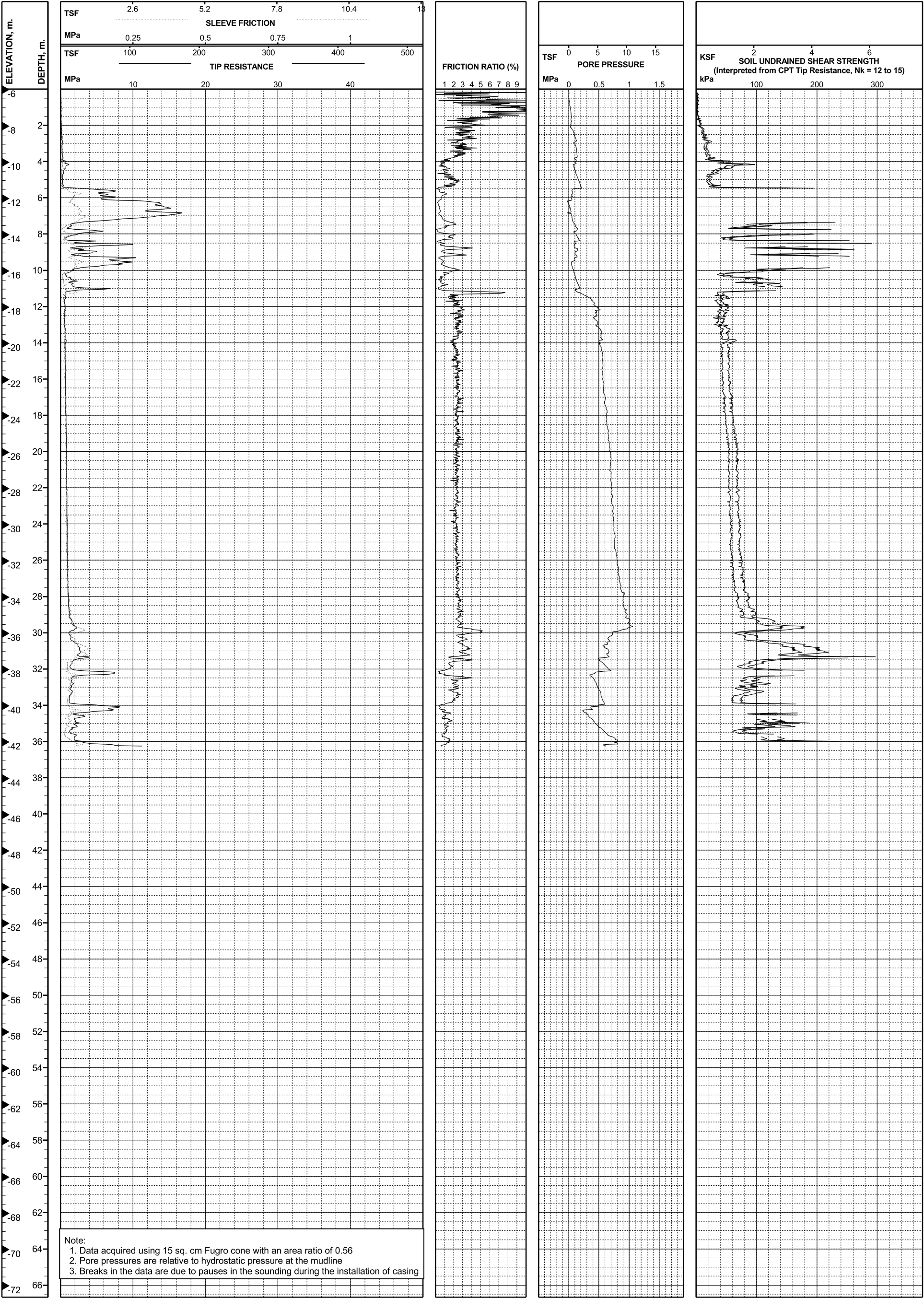




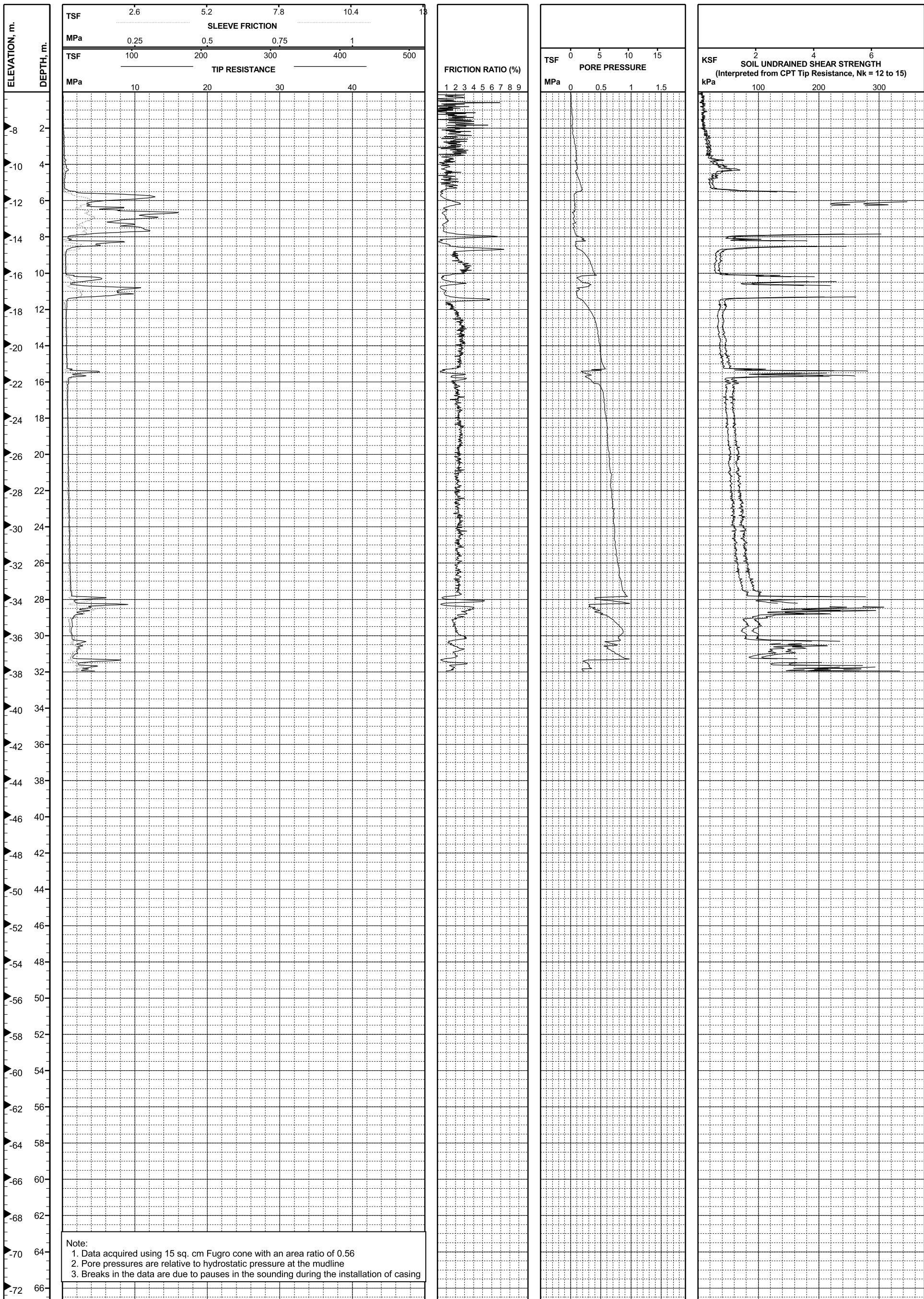








**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/25/00



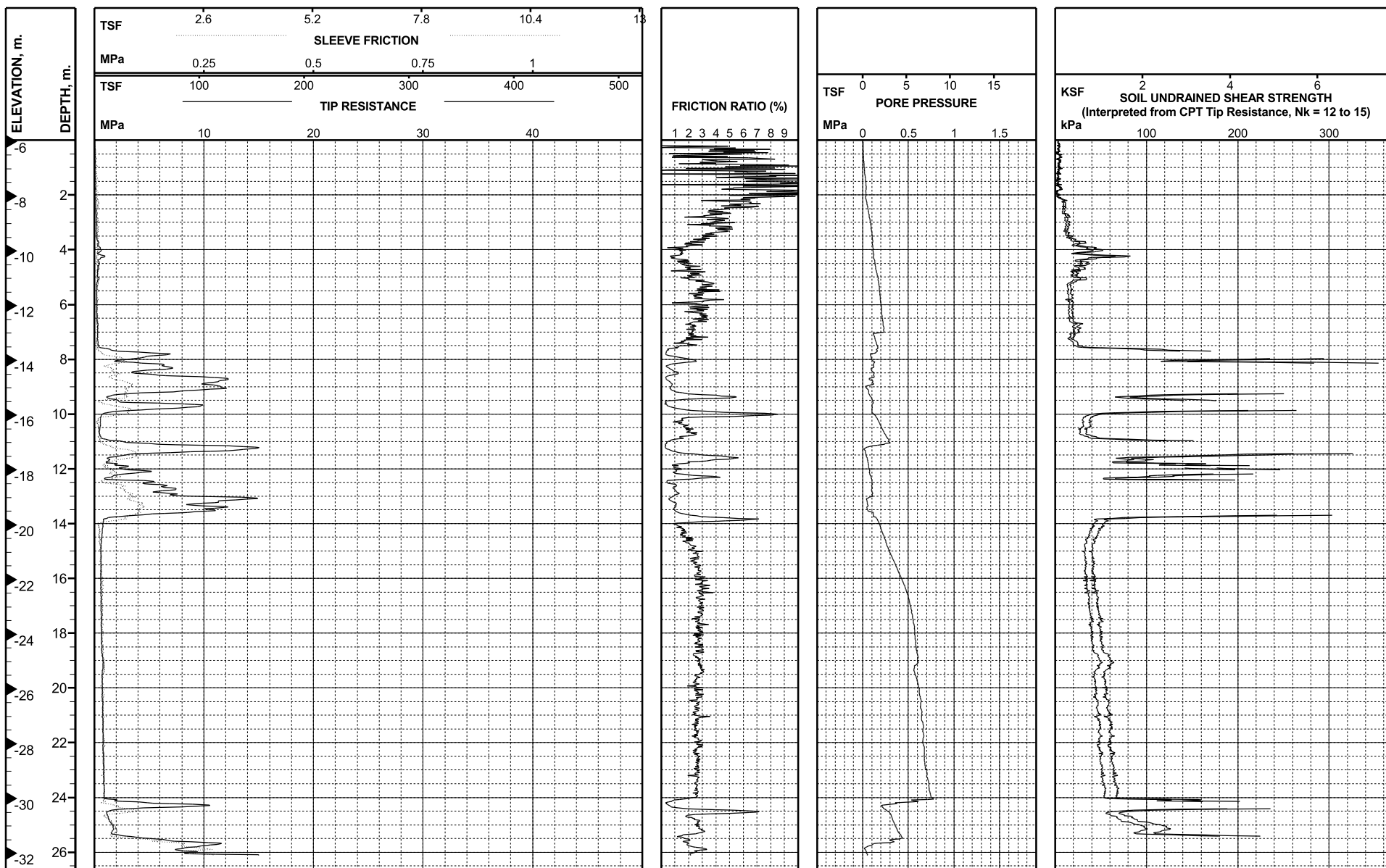
# SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-33 (11 m Right of "E" Stn. 69+59)

COORDINATES: E1837457 N648010 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -6.0 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/25/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-33

SFOBB East Span Seismic Safety Project

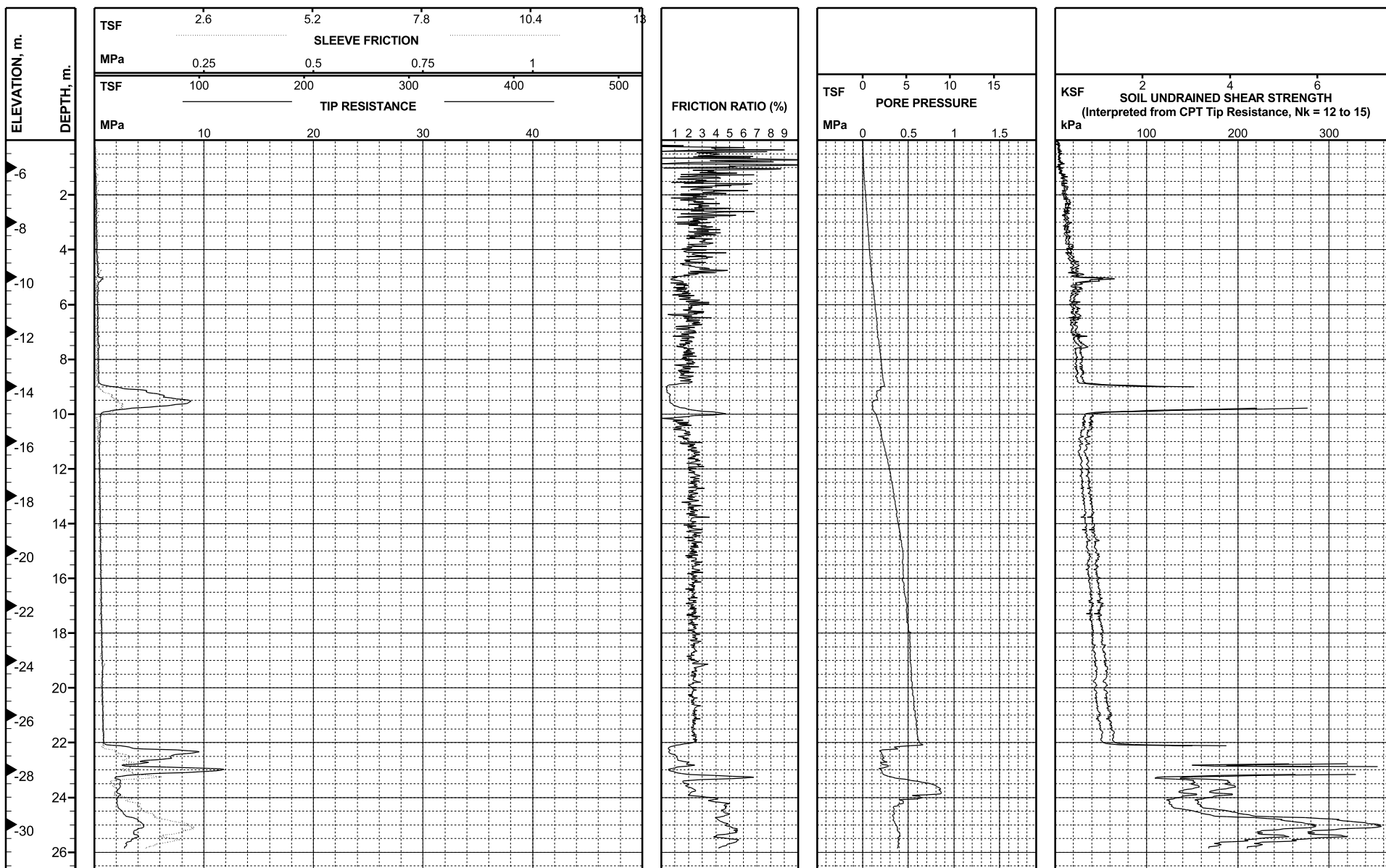




PROJECT NO: 98-42-0059  
SOUNDING: 00C-34 (21 m Left of "W" Stn. 71+20)

COORDINATES: E1837589 N648104 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -5.0 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/25/00

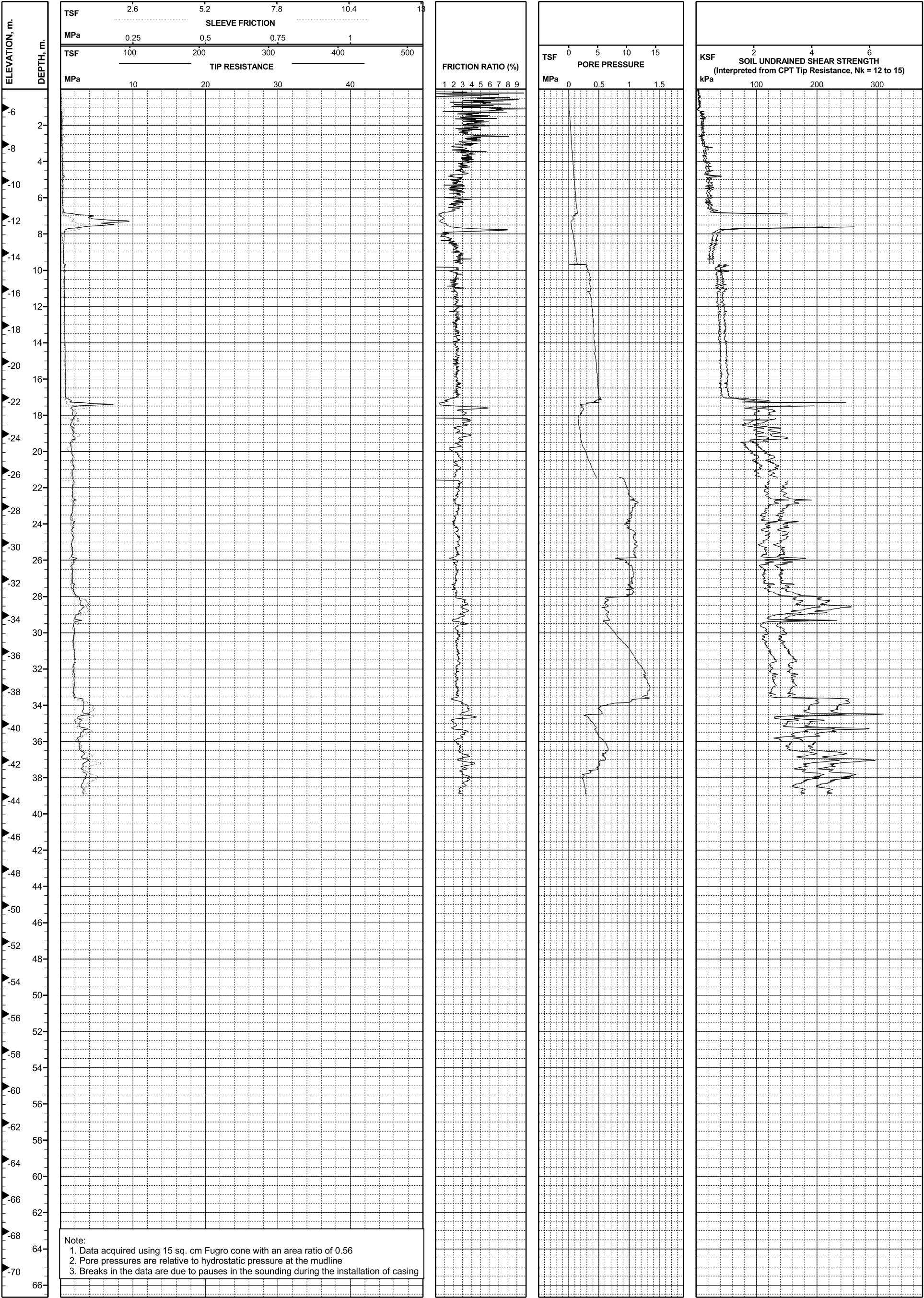


Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

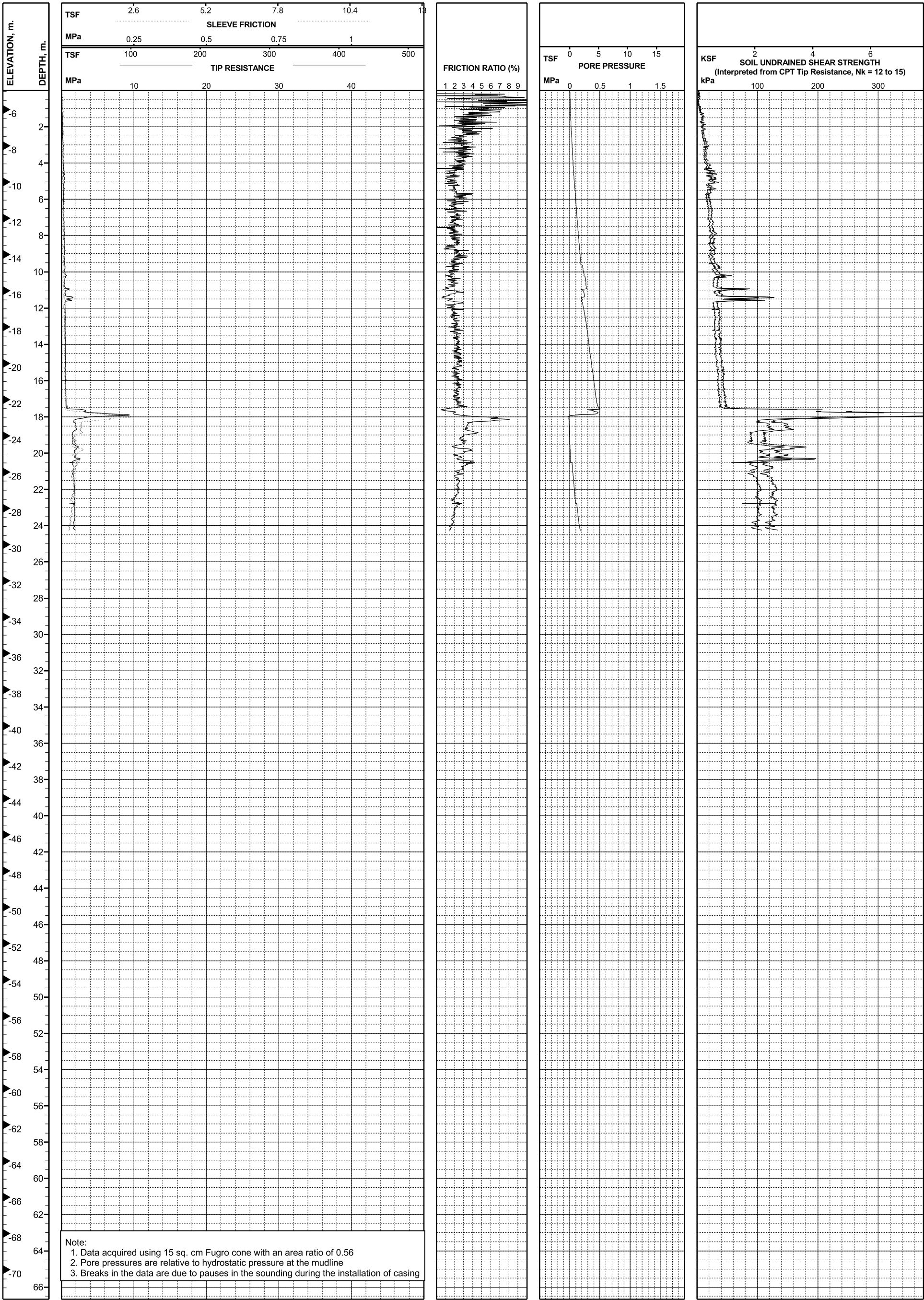
## LOG OF CPT SOUNDING 00C-34

SFOBB East Span Seismic Safety Project





**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/25/00

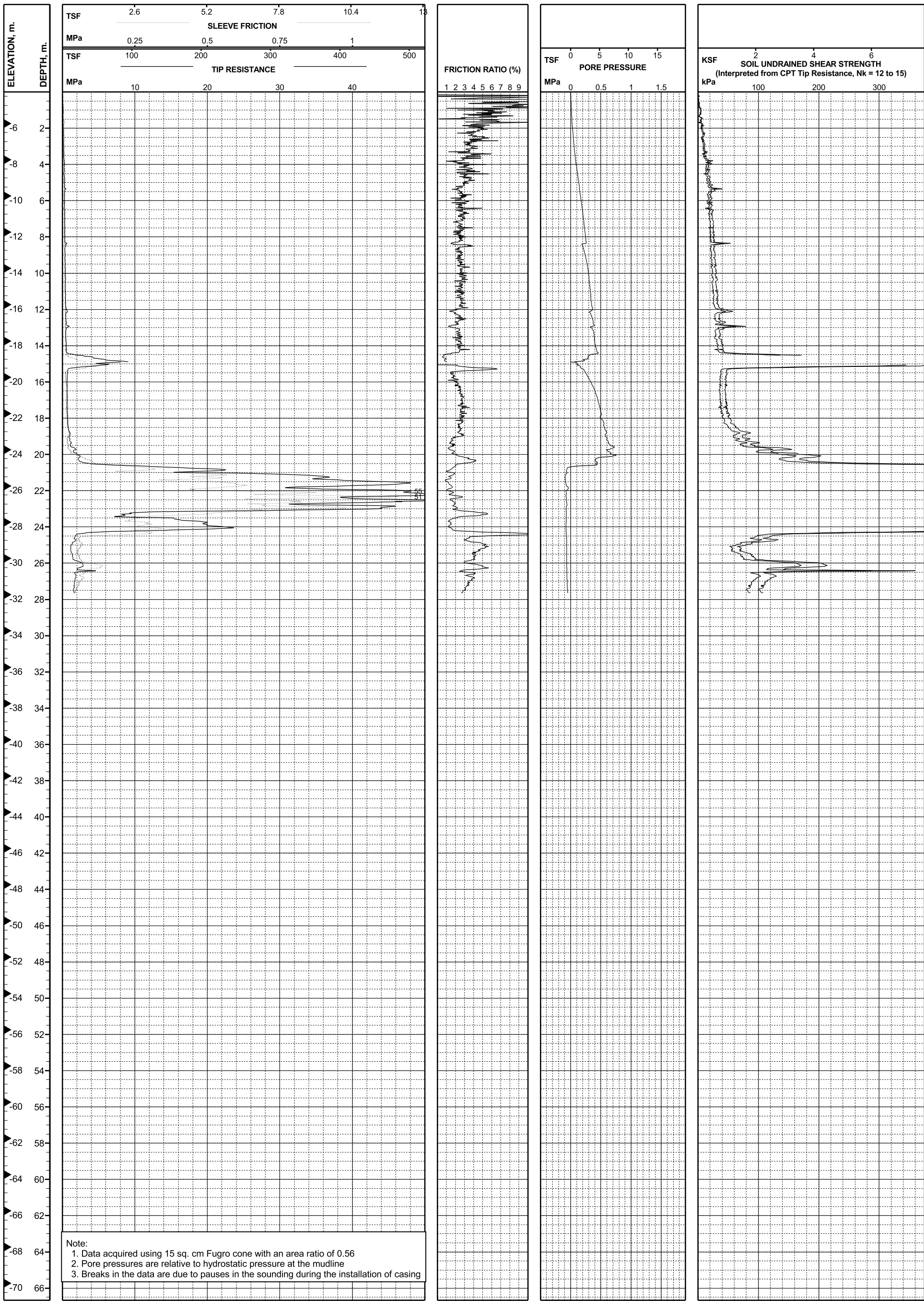


# LOG OF CPT SOUNDING 00C-36

# SFOBB East Span Seismic Safety Project

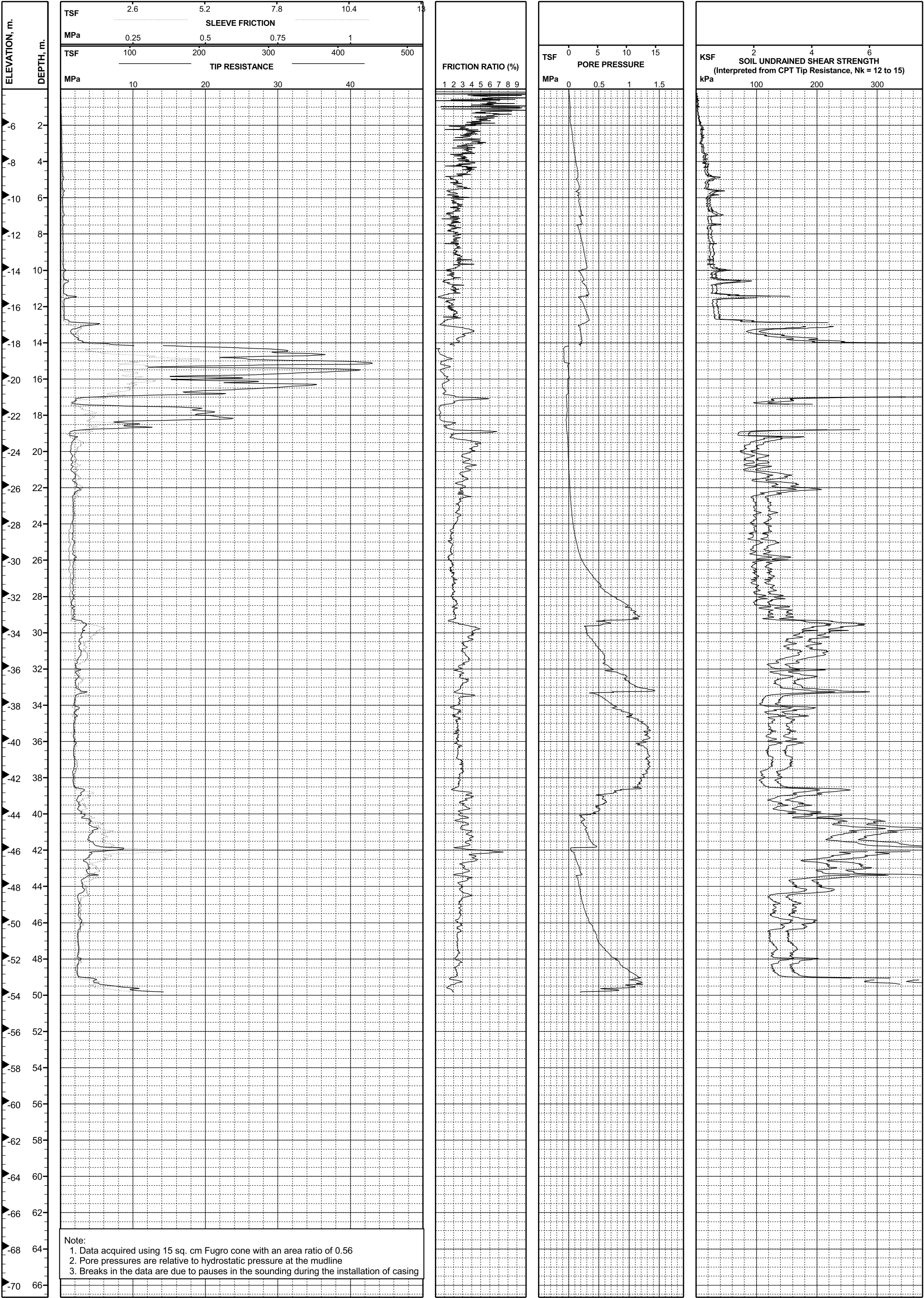


**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/27/00



# SFOBB East Span Seismic Safety Project

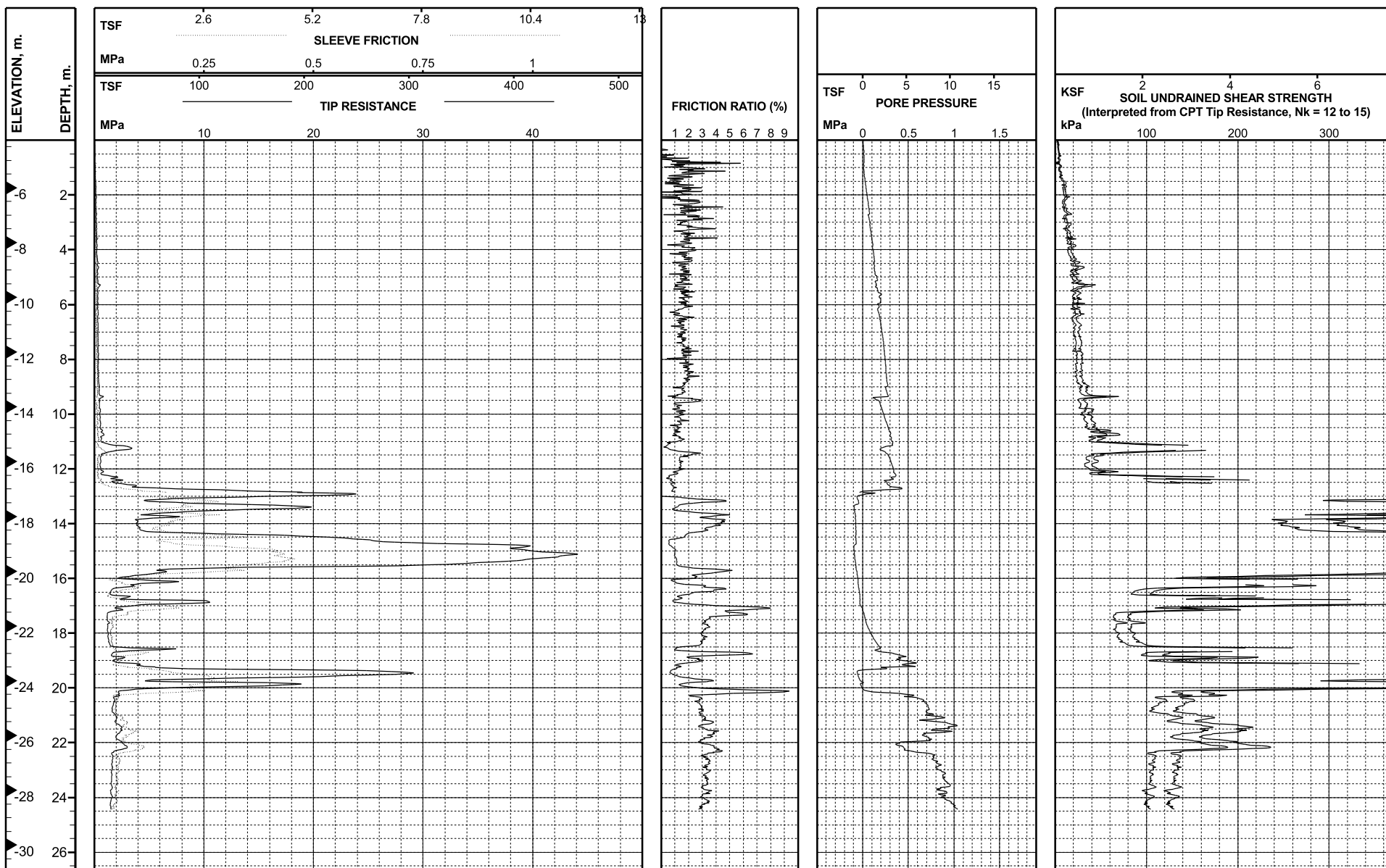




PROJECT NO: 98-42-0059  
SOUNDING: 00C-39 (12 m Right of "E" Stn. 72+59)

COORDINATES: E1837757 N648058 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -4.3 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/27/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-39

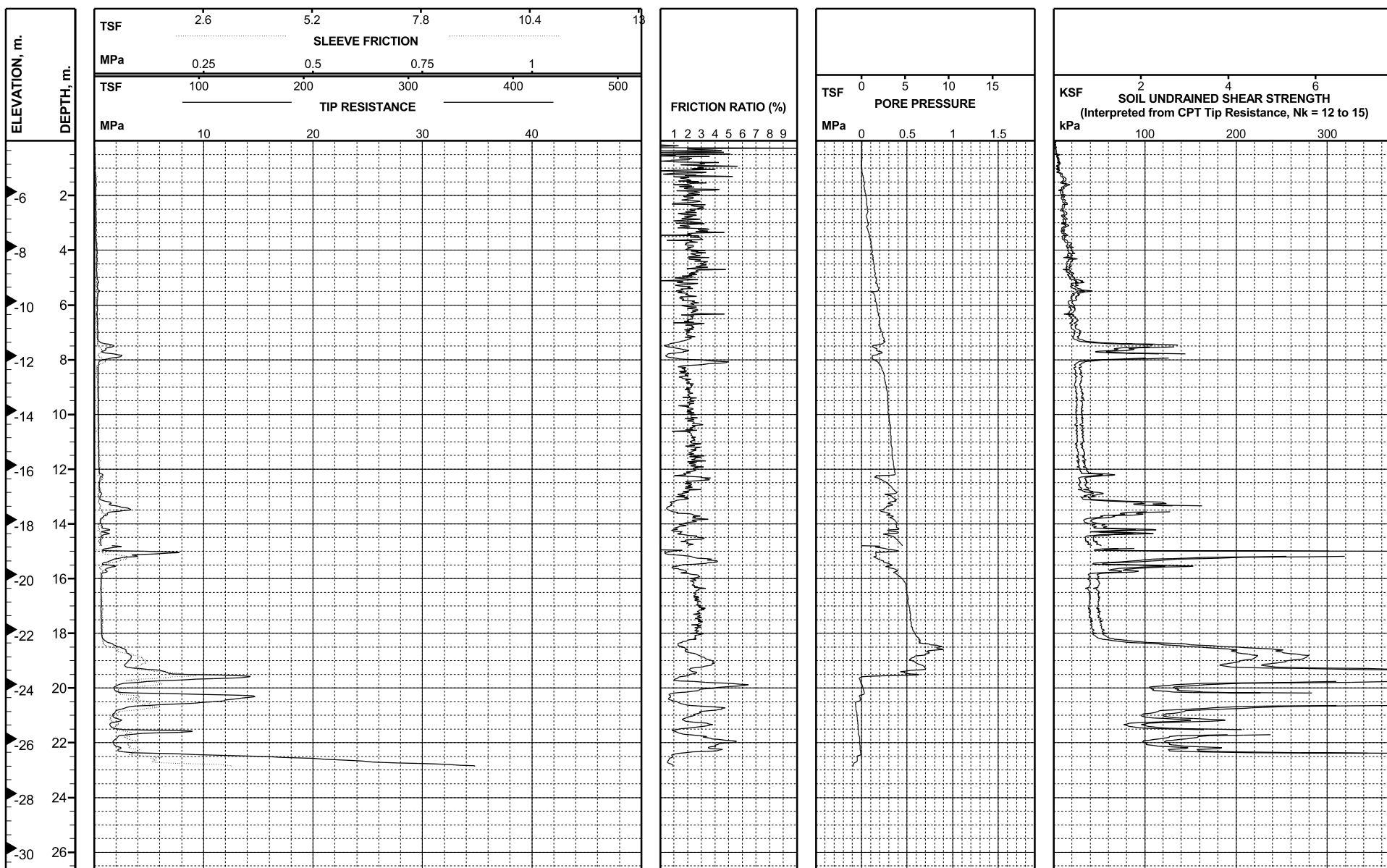
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-40 (13 m Left of "W" Stn. 74+40)

COORDINATES: E1837905 N648149 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -4.1 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/03/00



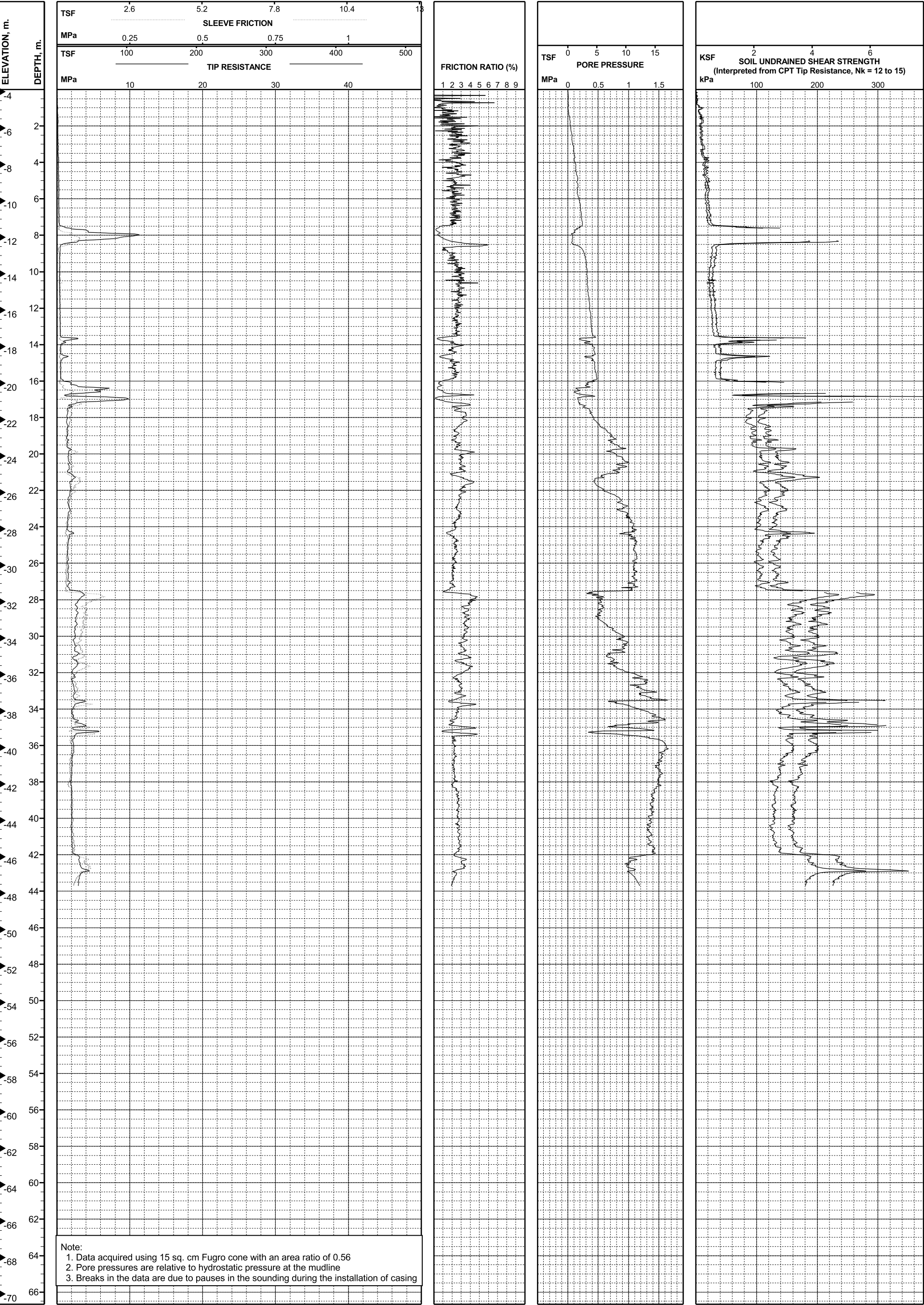
Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-40

SFOBB East Span Seismic Safety Project

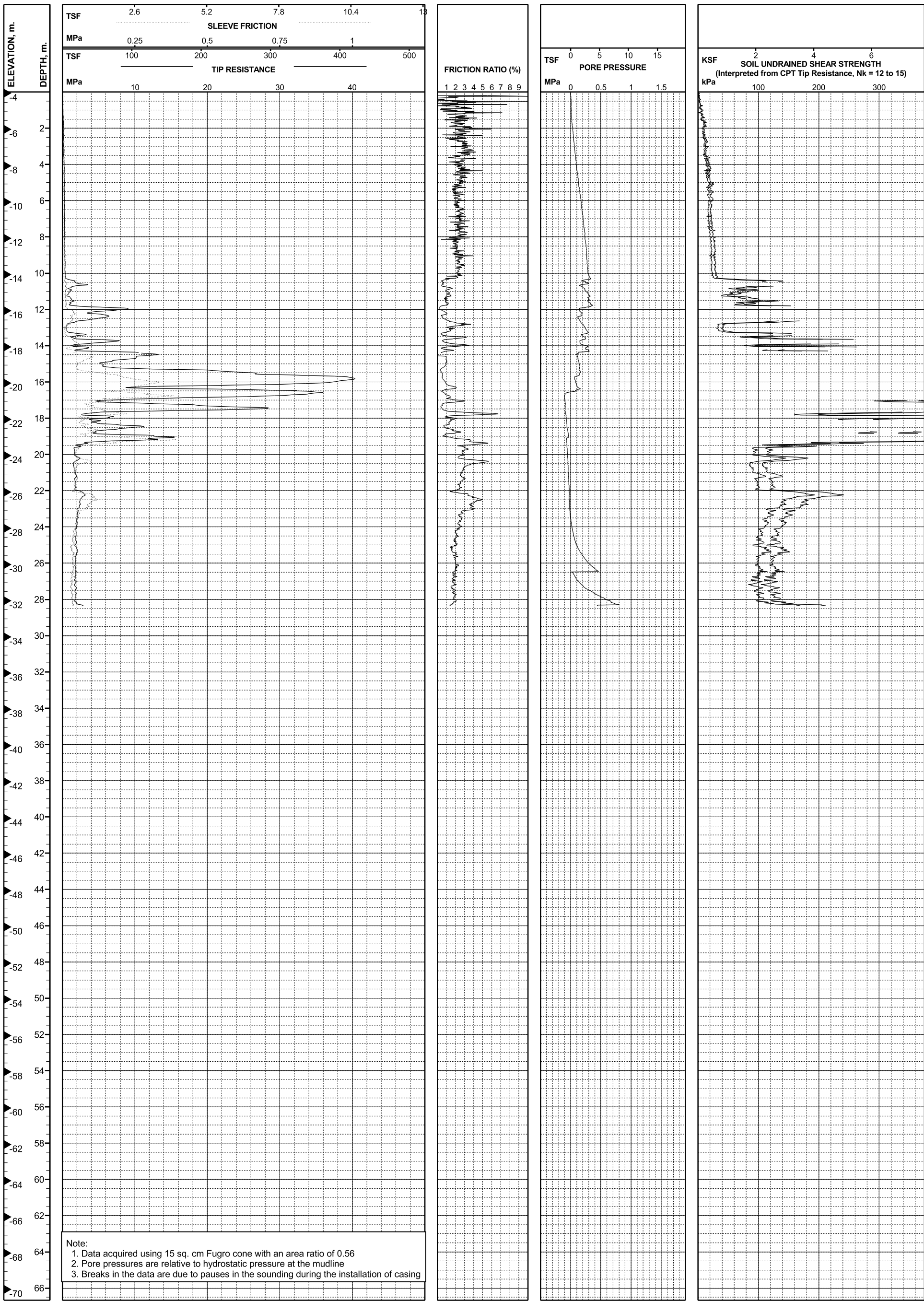








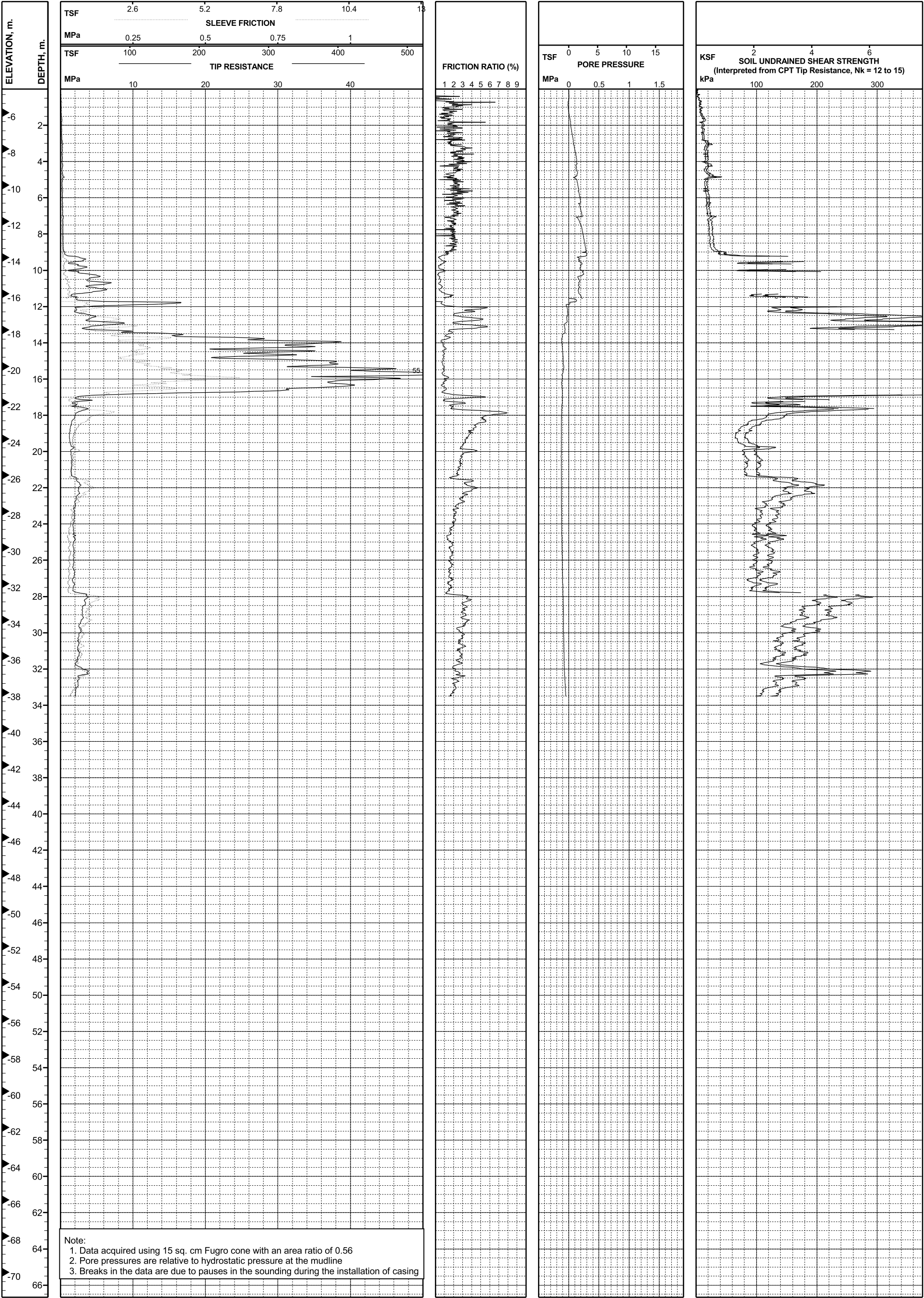
**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 10/03/00

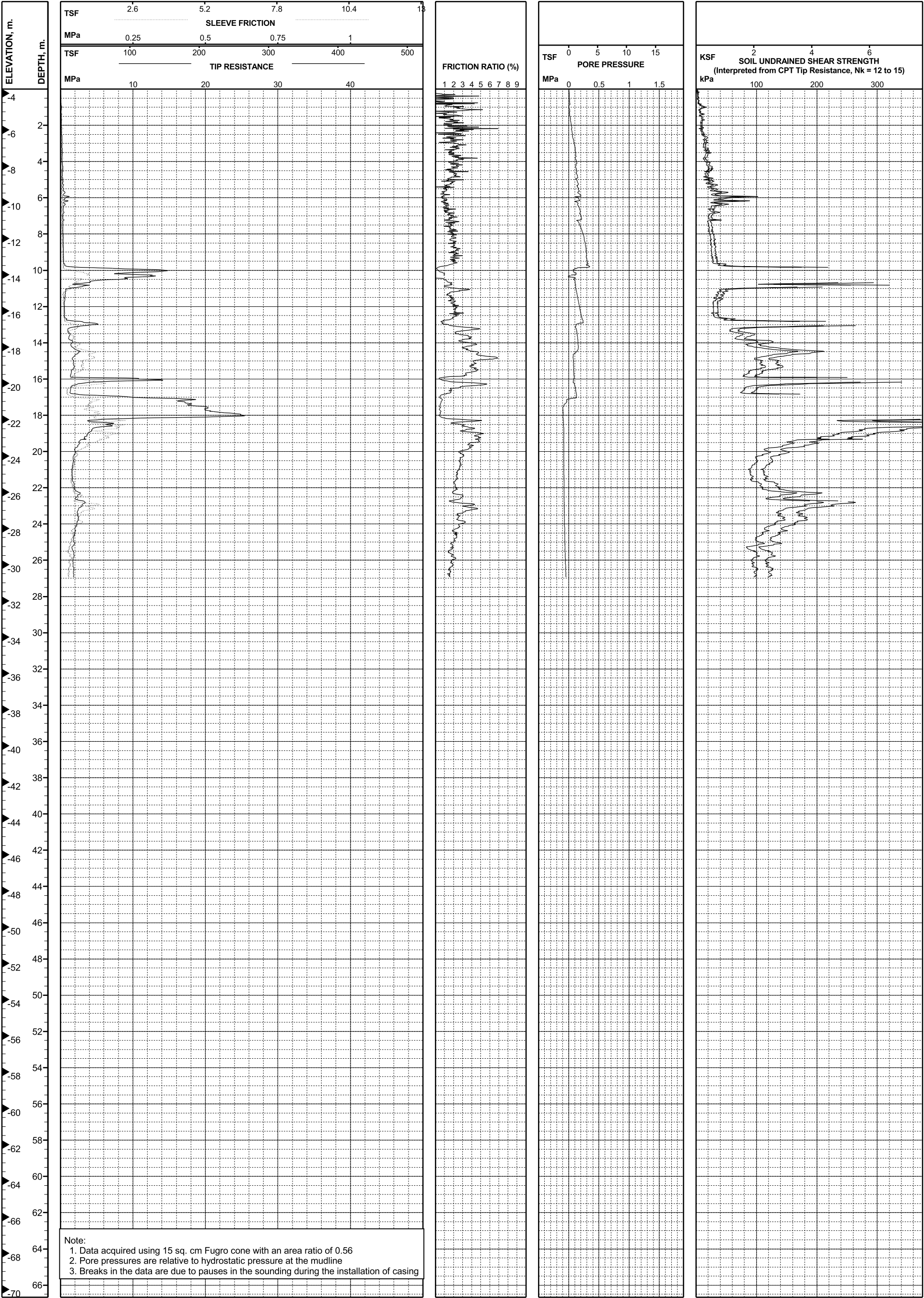


# LOG OF CPT SOUNDING 00C-42

# SFOBB East Span Seismic Safety Project



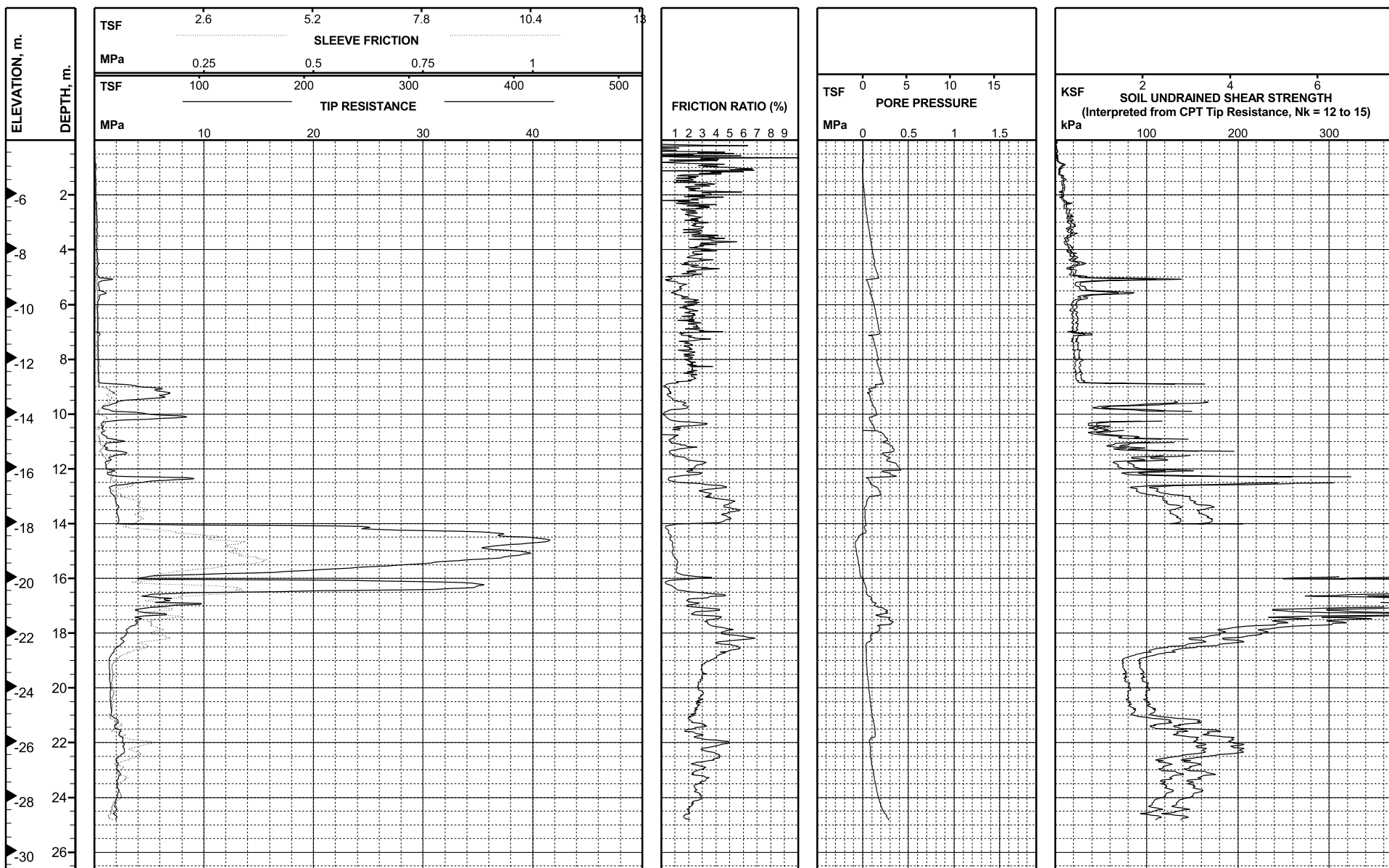




PROJECT NO: 98-42-0059  
SOUNDING: 00C-45 (9 m Right of "E" Stn. 75+79)

COORDINATES: E1838076 N648115 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -4.1 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/03/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-45

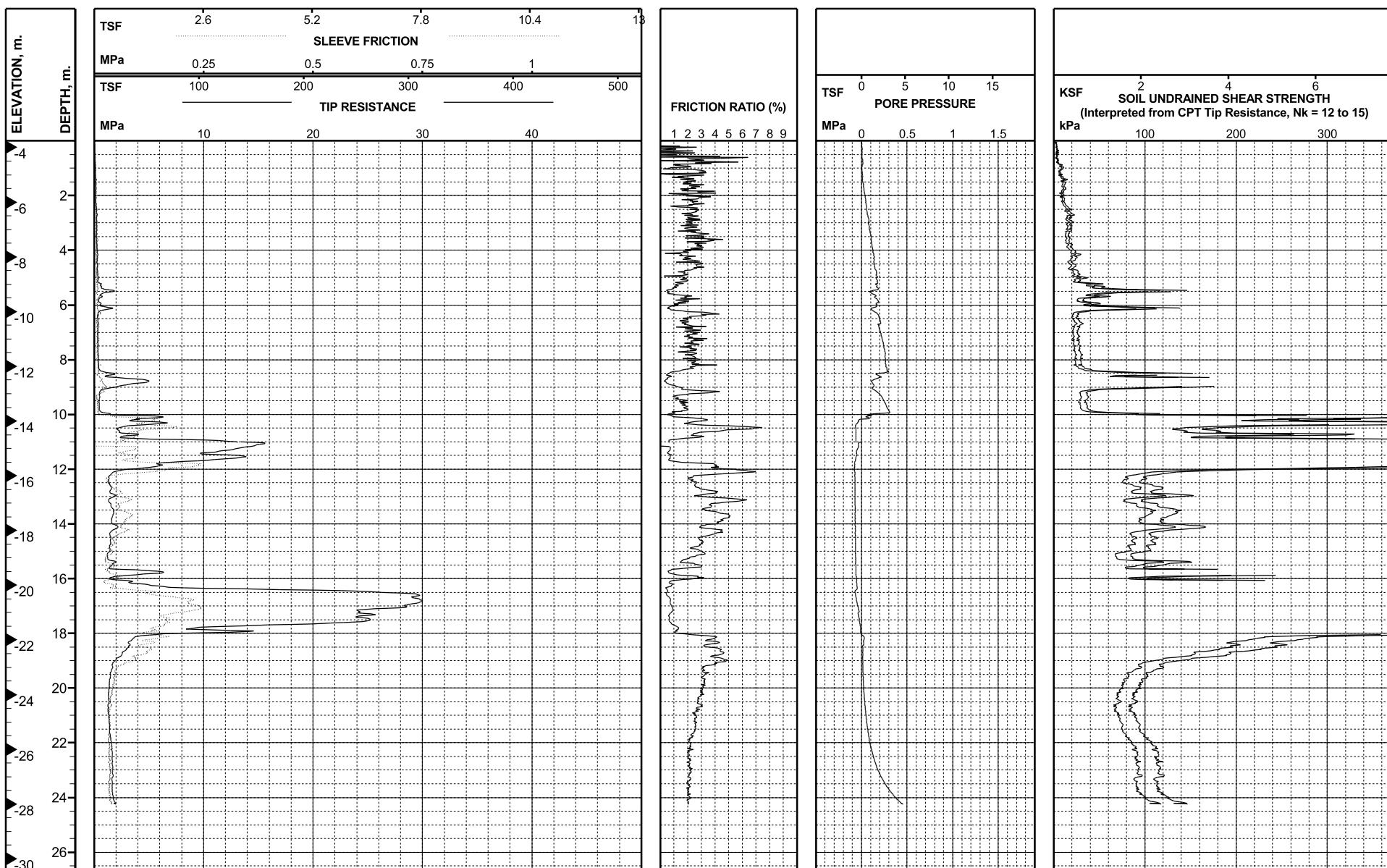
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-46 (27 m Left of "W" Stn. 77+59)

COORDINATES: E1838222 N648214 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -3.8 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/03/00

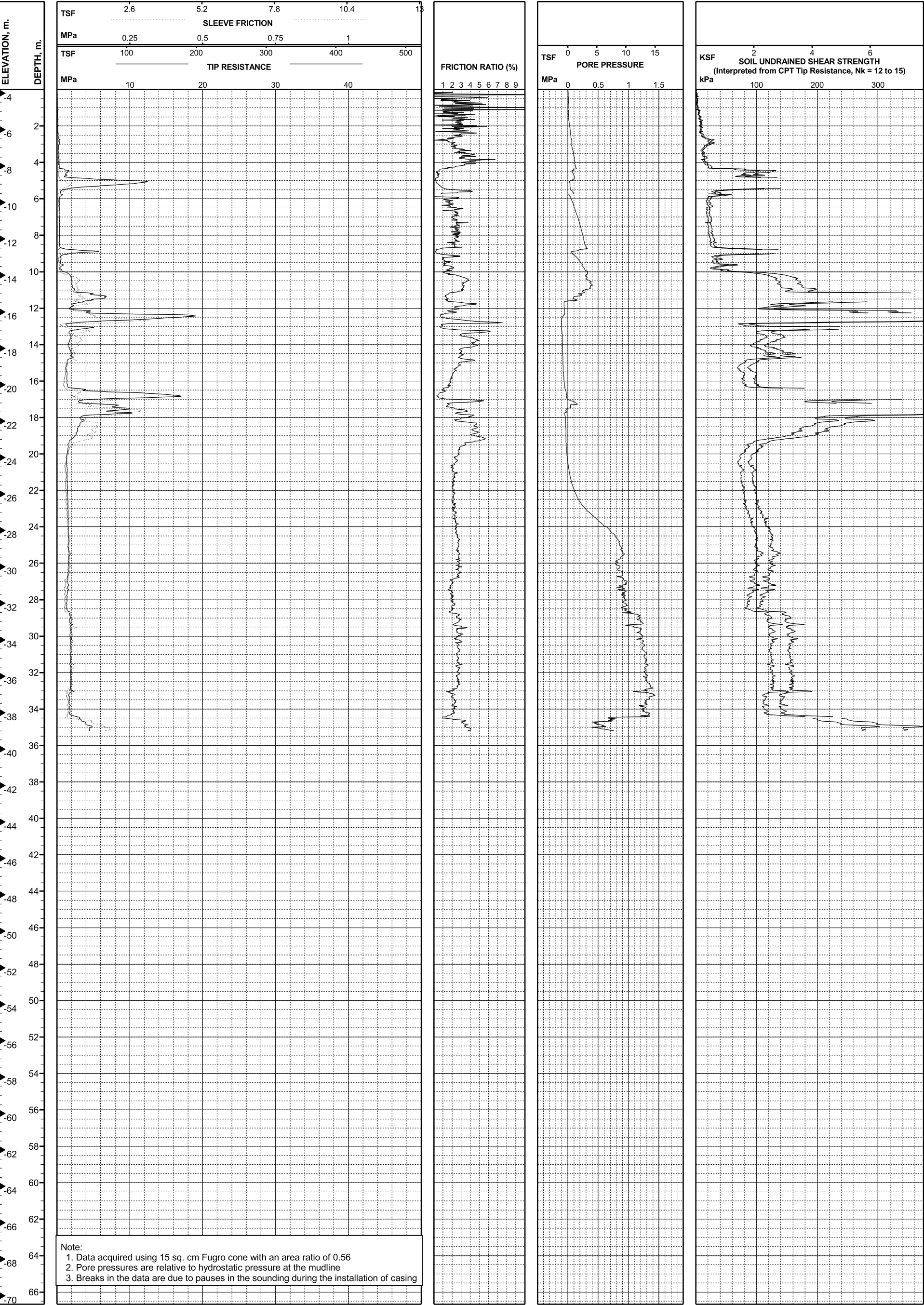


Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

# LOG OF CPT SOUNDING 00C-46

SFOBB East Span Seismic Safety Project

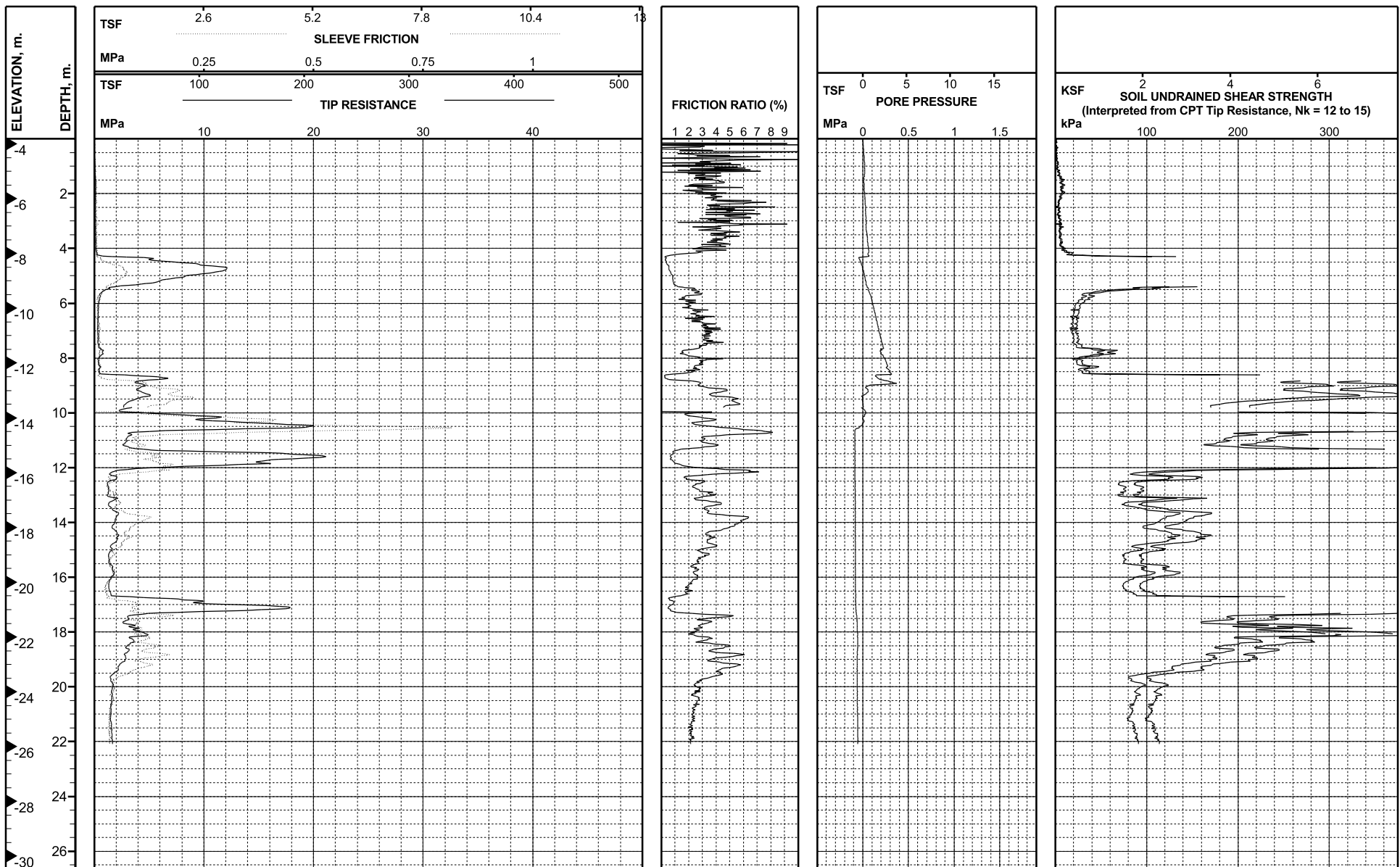




PROJECT NO: 98-42-0059  
SOUNDING: 00C-48 (12 m Right of "E" Stn. 77+59)

COORDINATES: E1838243 N648139 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -3.8 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/03/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-48

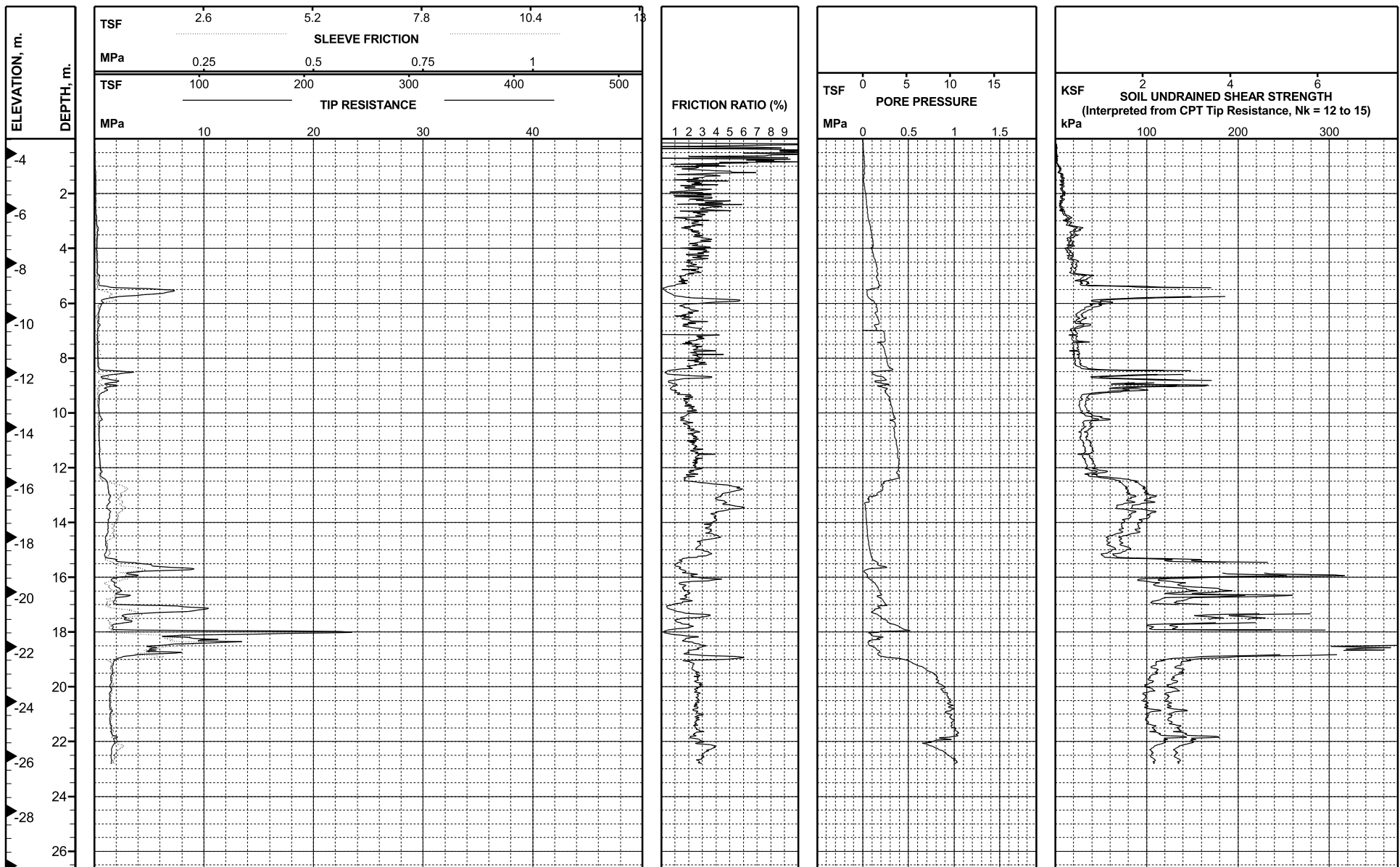
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-49 (12 m Left of "W" Stn. 79+20)

COORDINATES: E1838370 N648223 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -3.5 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/04/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

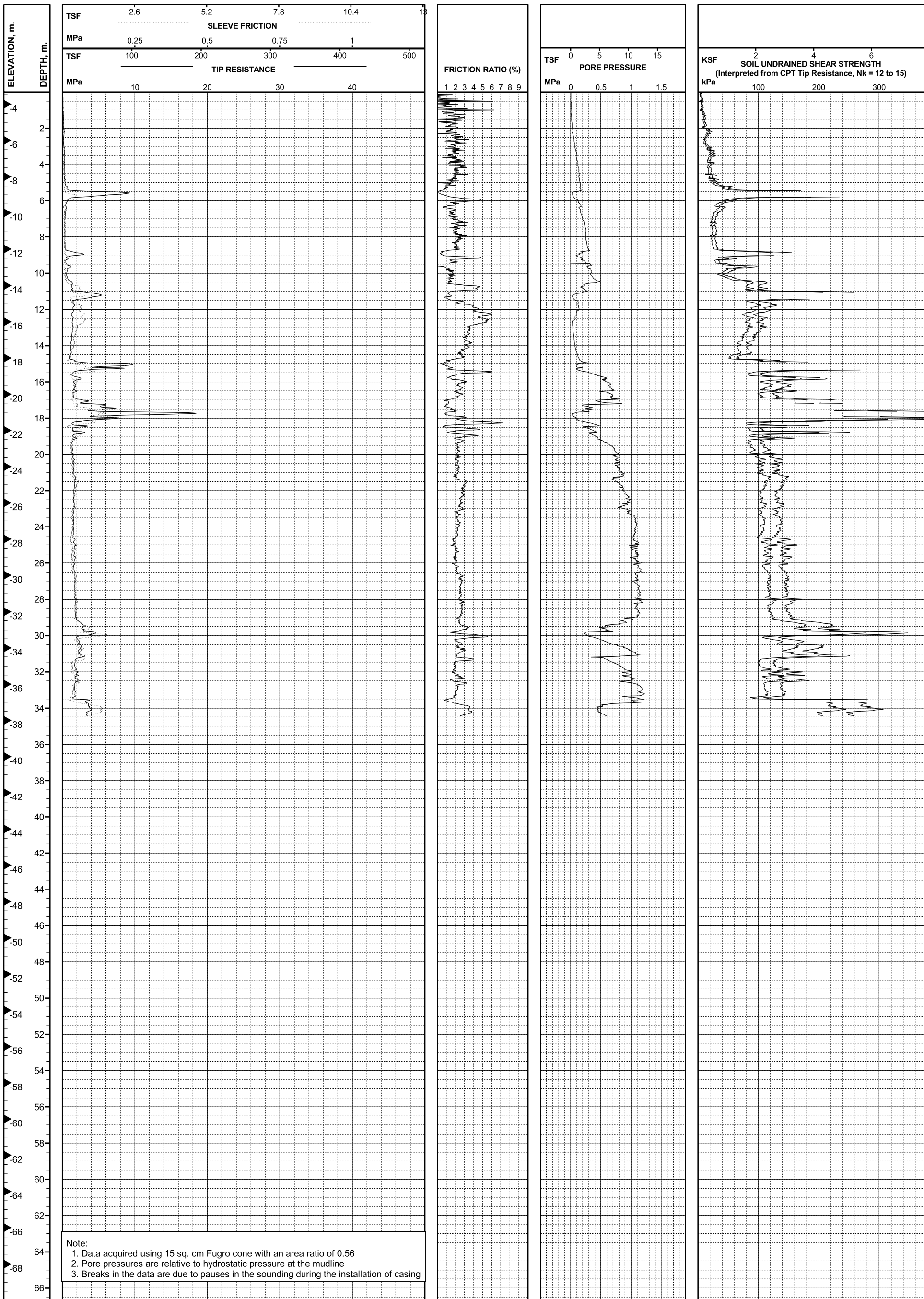
## LOG OF CPT SOUNDING 00C-49

SFOBB East Span Seismic Safety Project





**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 10/04/00

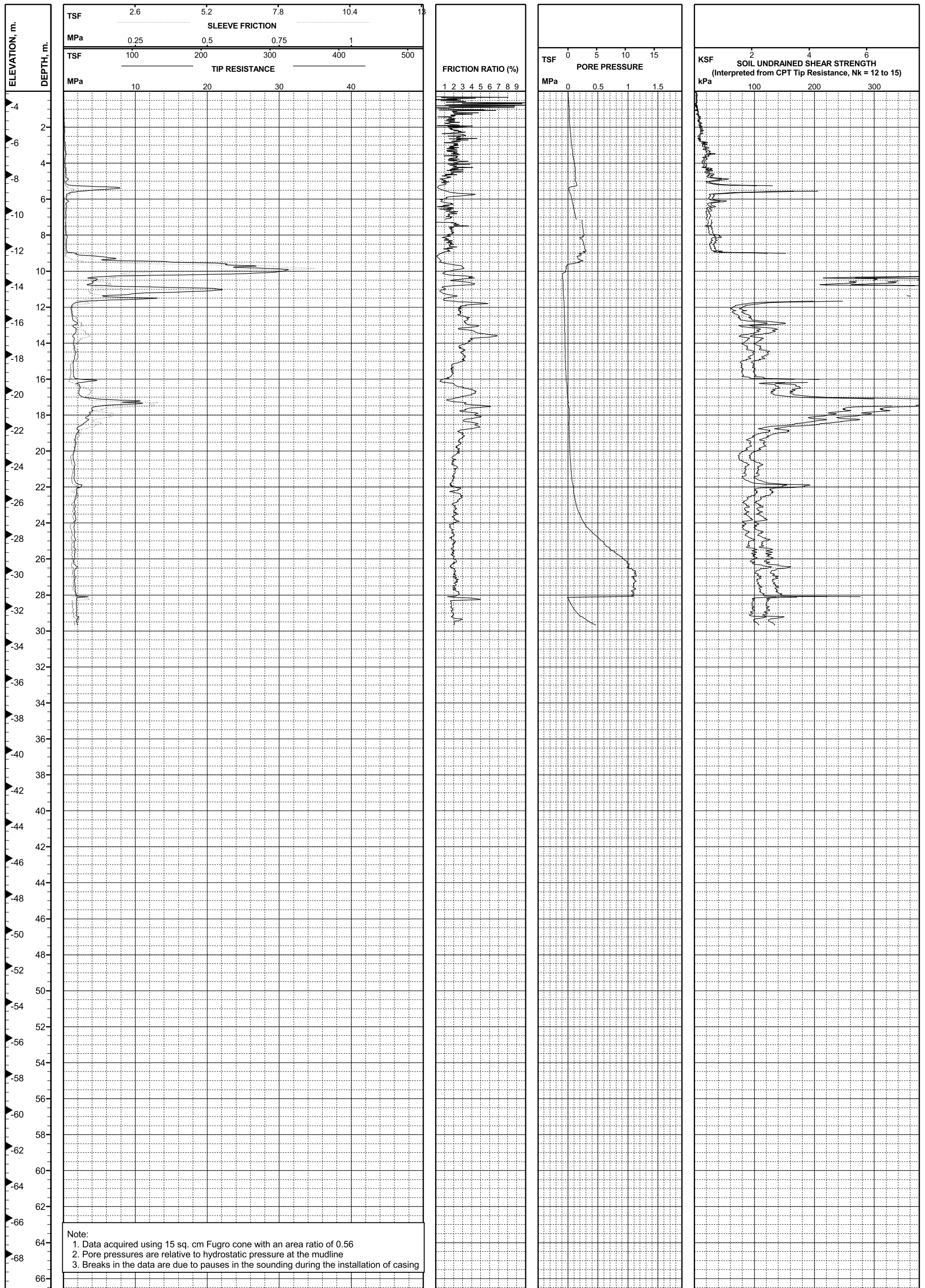


# LOG OF CPT SOUNDING 00C-50

# SFOBB East Span Seismic Safety Project



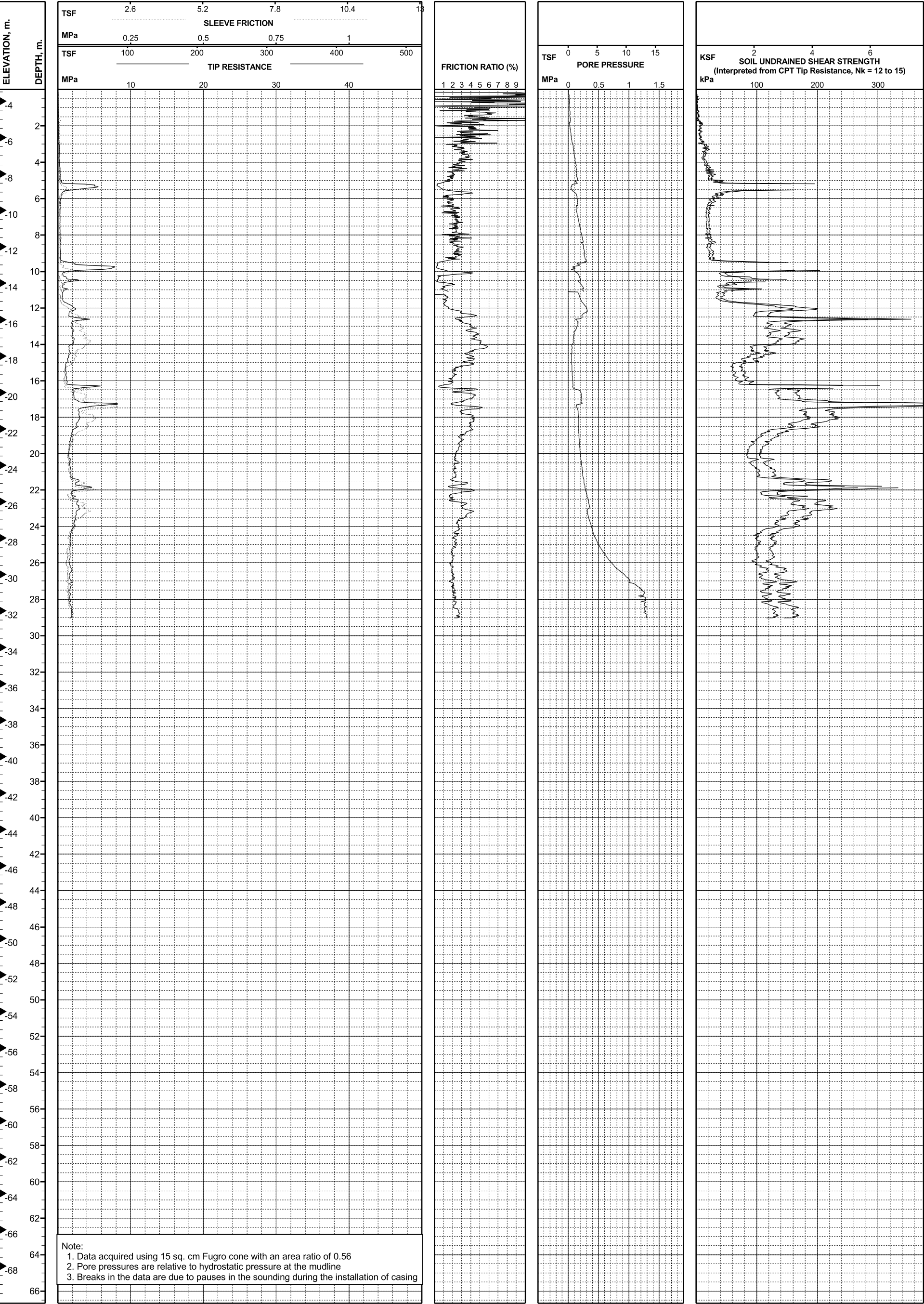
**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 10/04/00

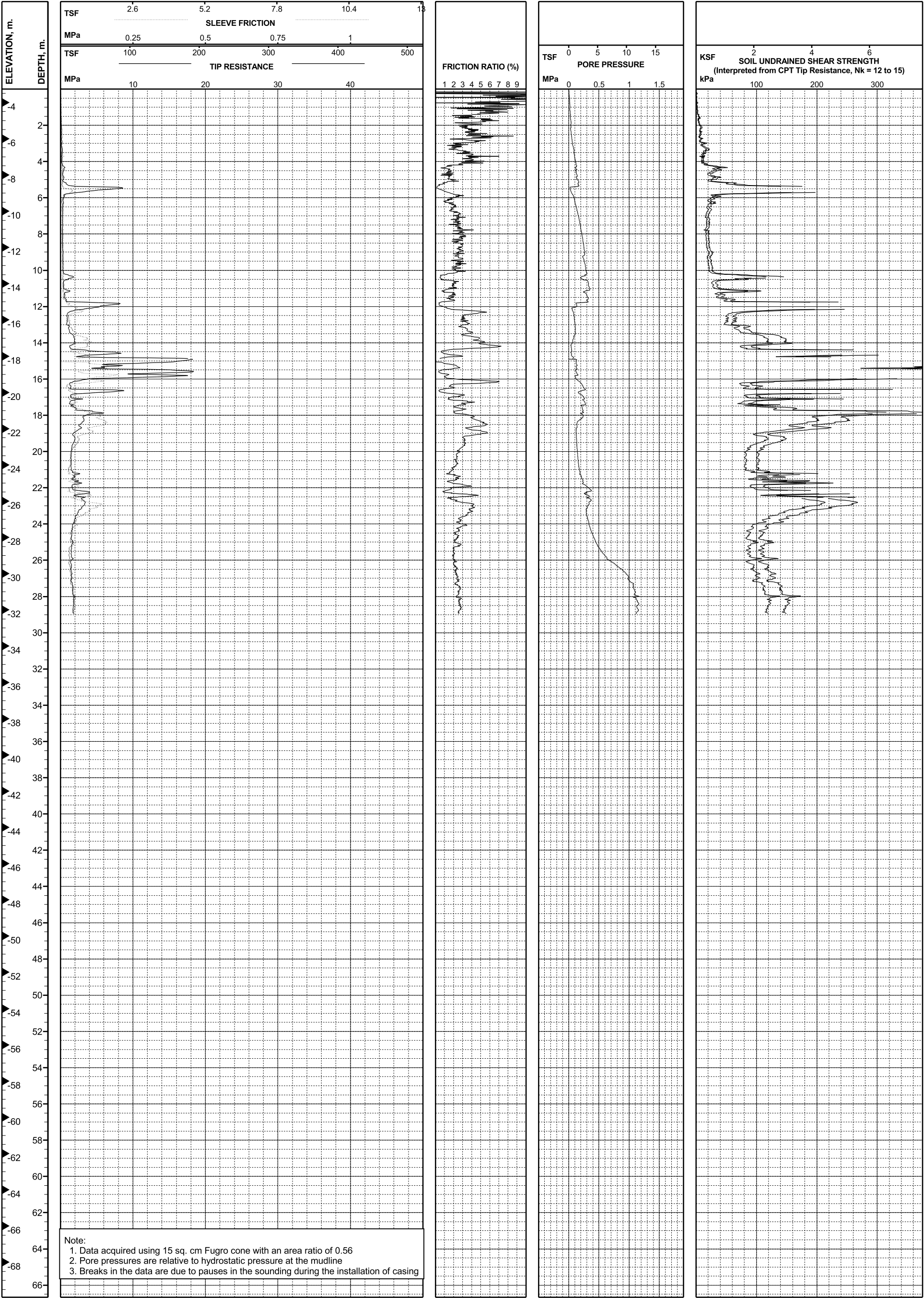


# LOG OF CPT SOUNDING 00C-51

SFOBB East Span Seismic Safety Project







FRICITION RATIO (%)

1

2

3

4

5

6

7

8

9

Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56

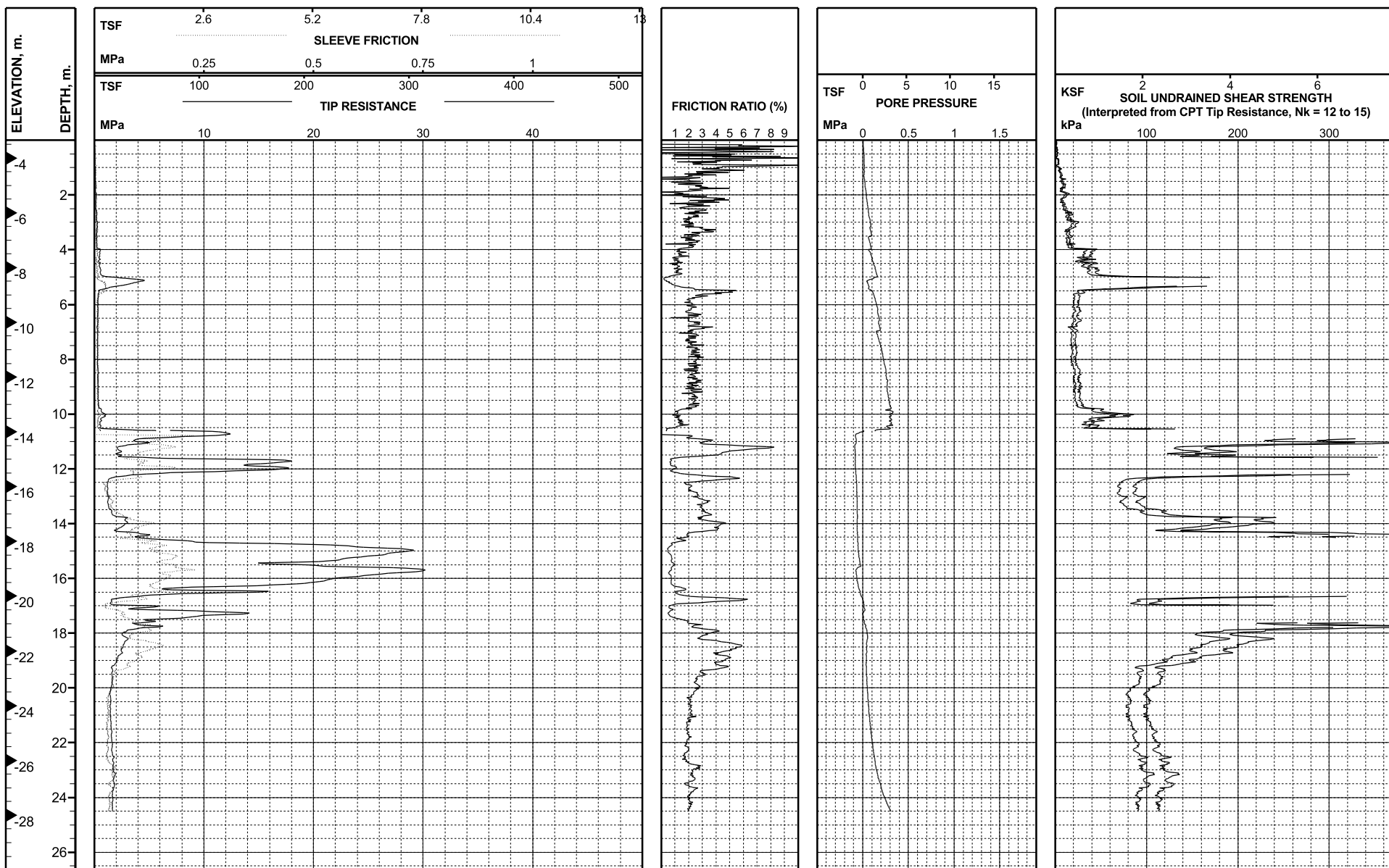
2. Pore pressures are relative to hydrostatic pressure at the mudline

3. Breaks in the data are due to pauses in the sounding during the installation of casing

PROJECT NO: 98-42-0059  
SOUNDING: 00C-54 (4 m Left of "W" Stn. 80+79)

COORDINATES: E1838527 N648242 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -3.3 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/04/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-54

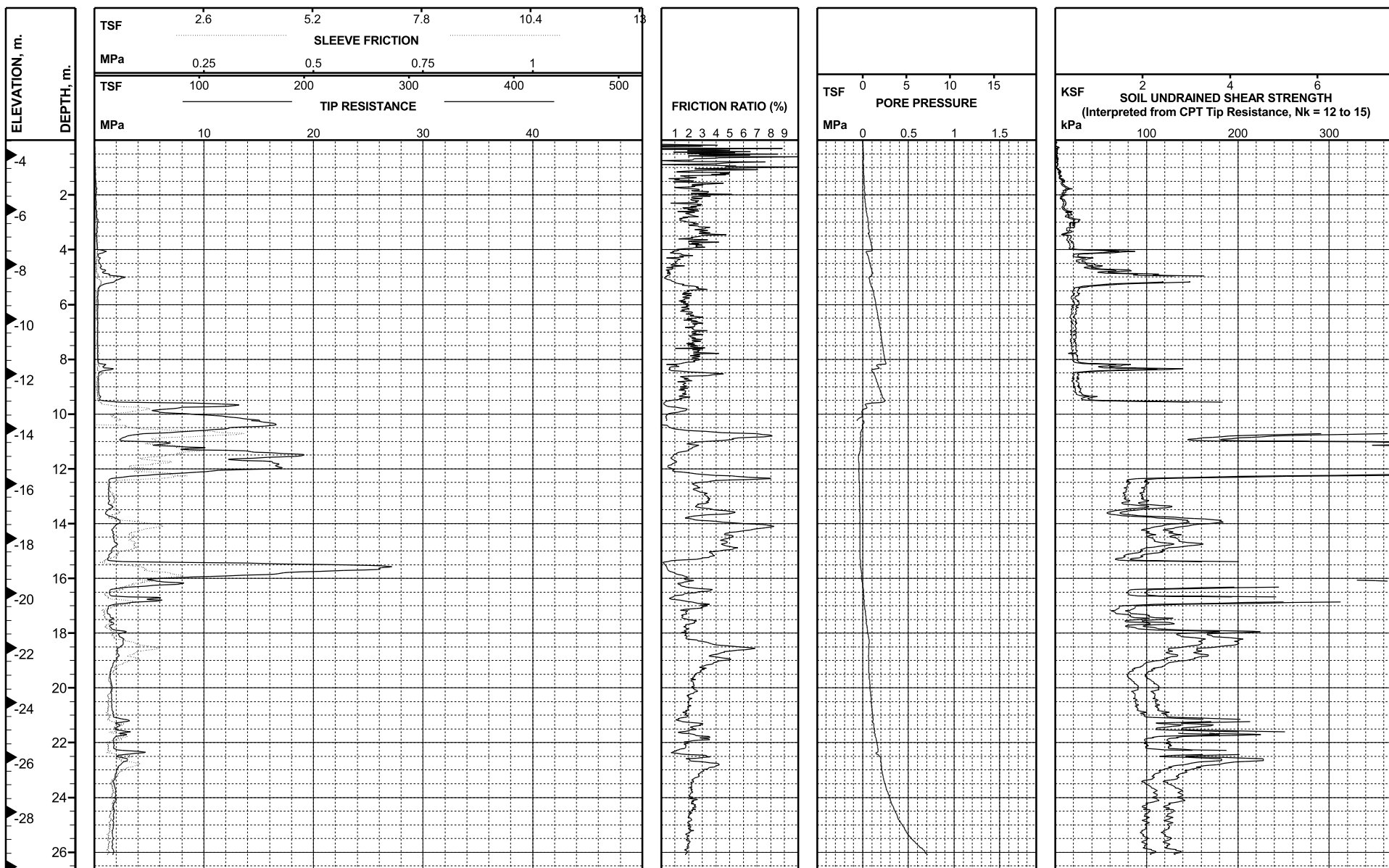
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-55 (5 m Left of "E" Stn. 80+20)

COORDINATES: E1838513 N648198 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -3.5 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 10/04/00



Note:

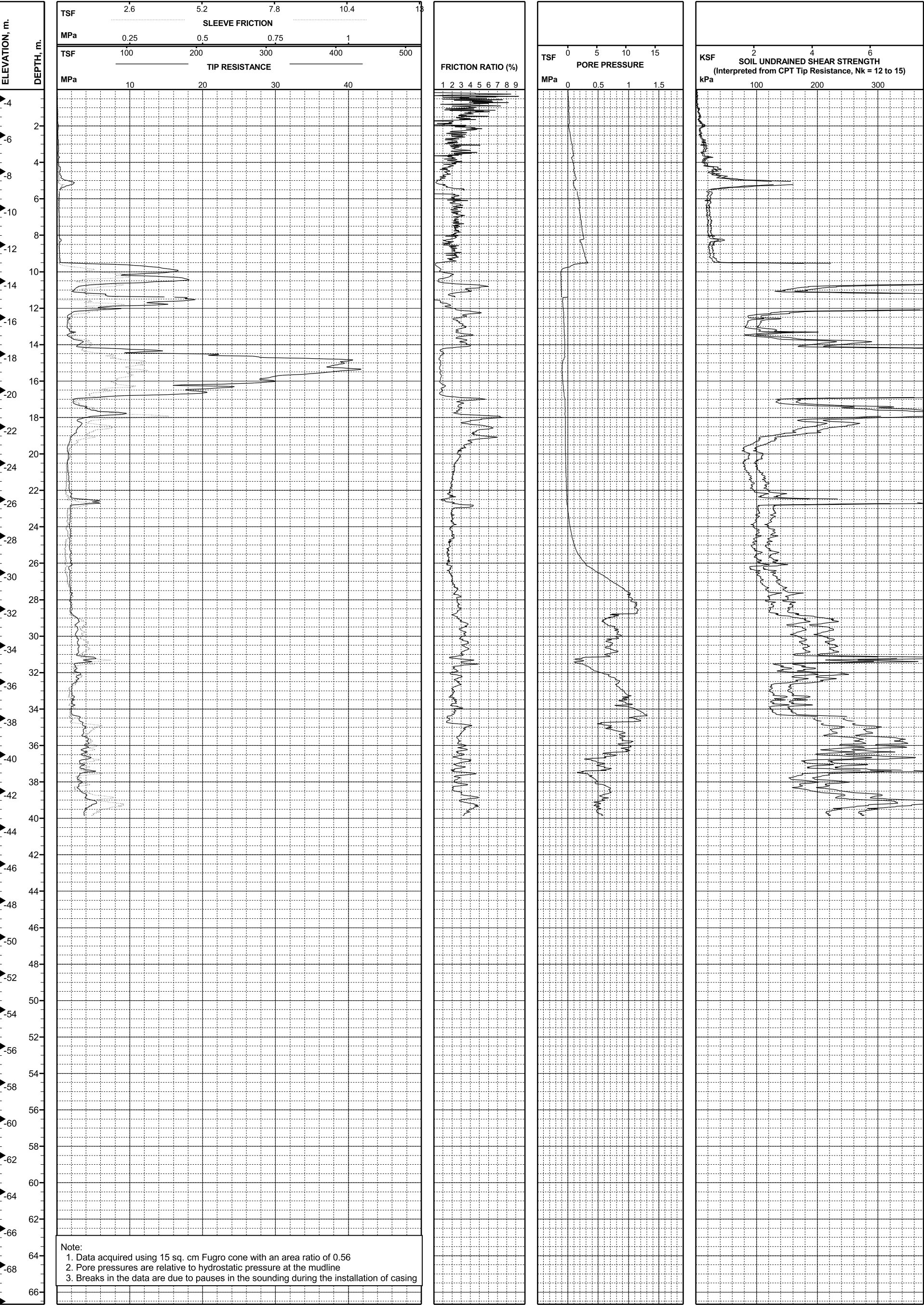
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

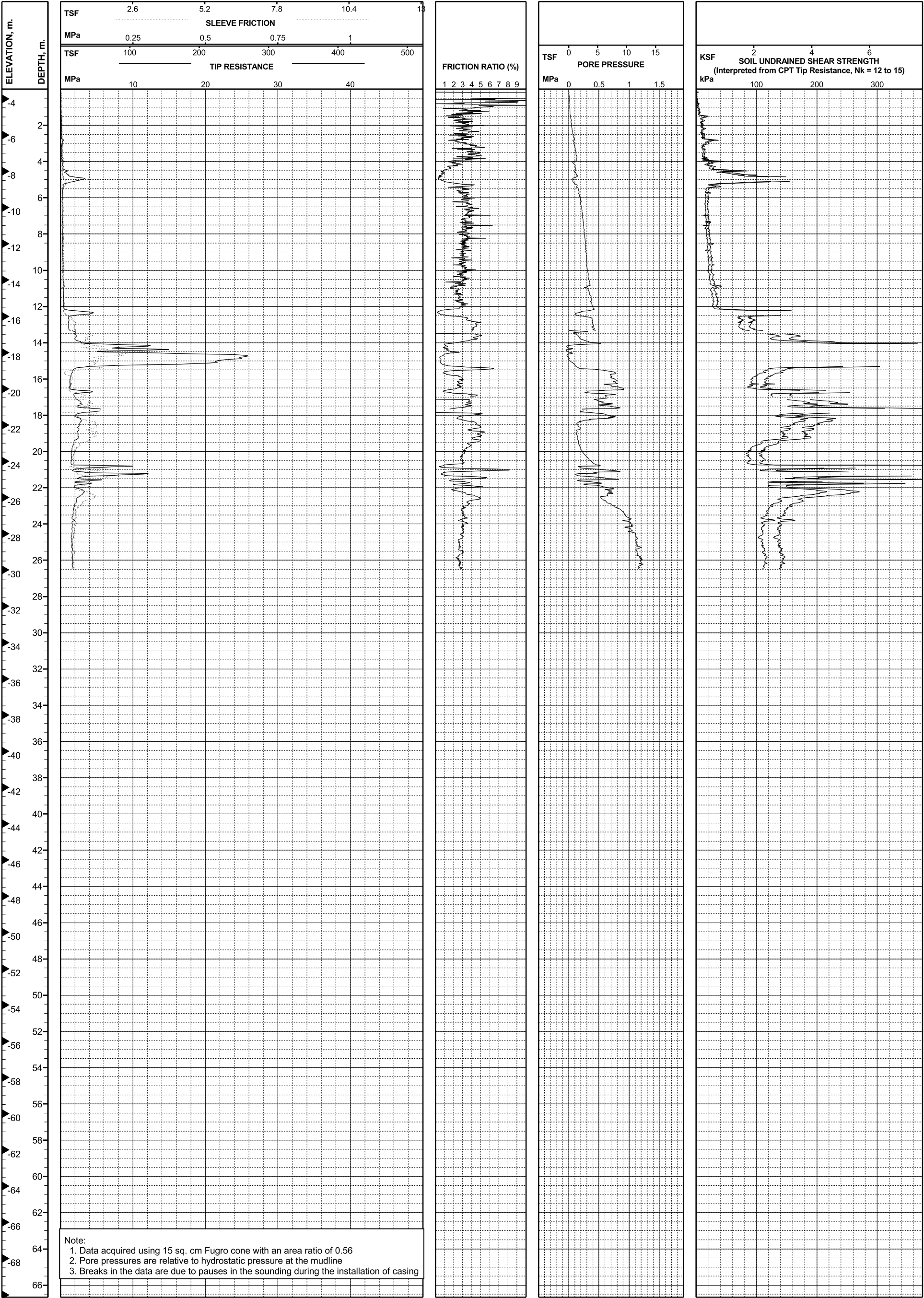
## LOG OF CPT SOUNDING 00C-55

SFOBB East Span Seismic Safety Project

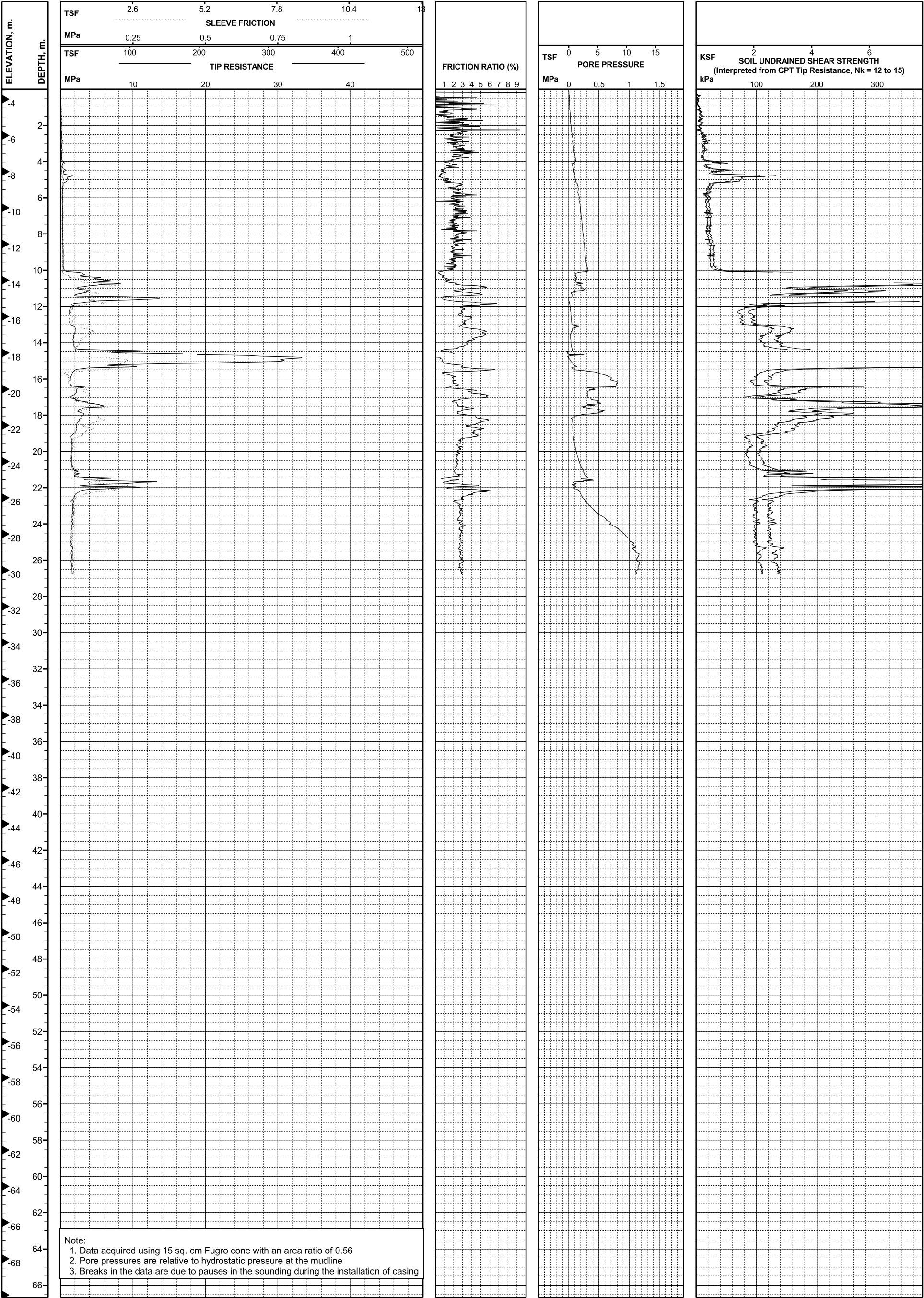




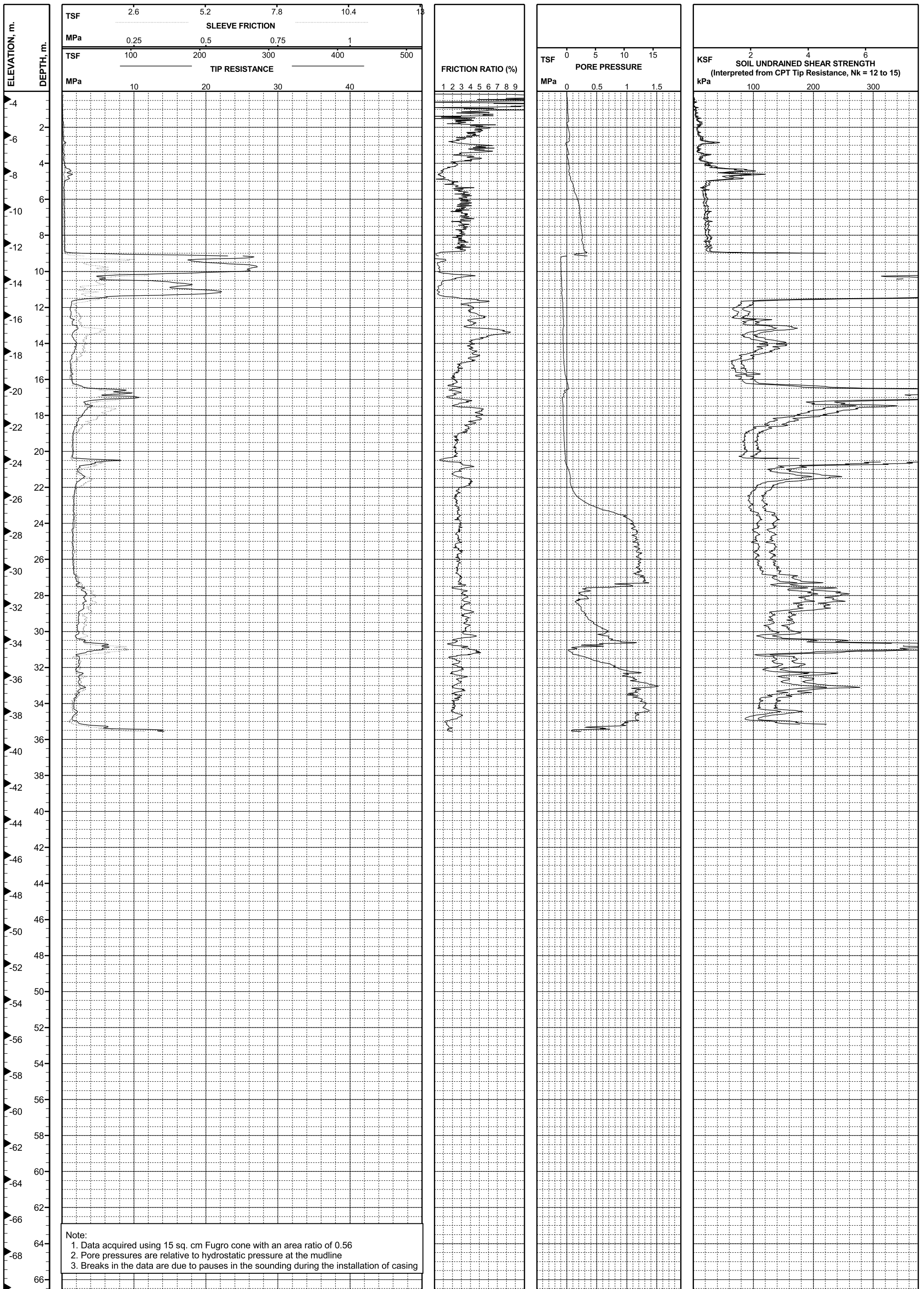








**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 10/05/00

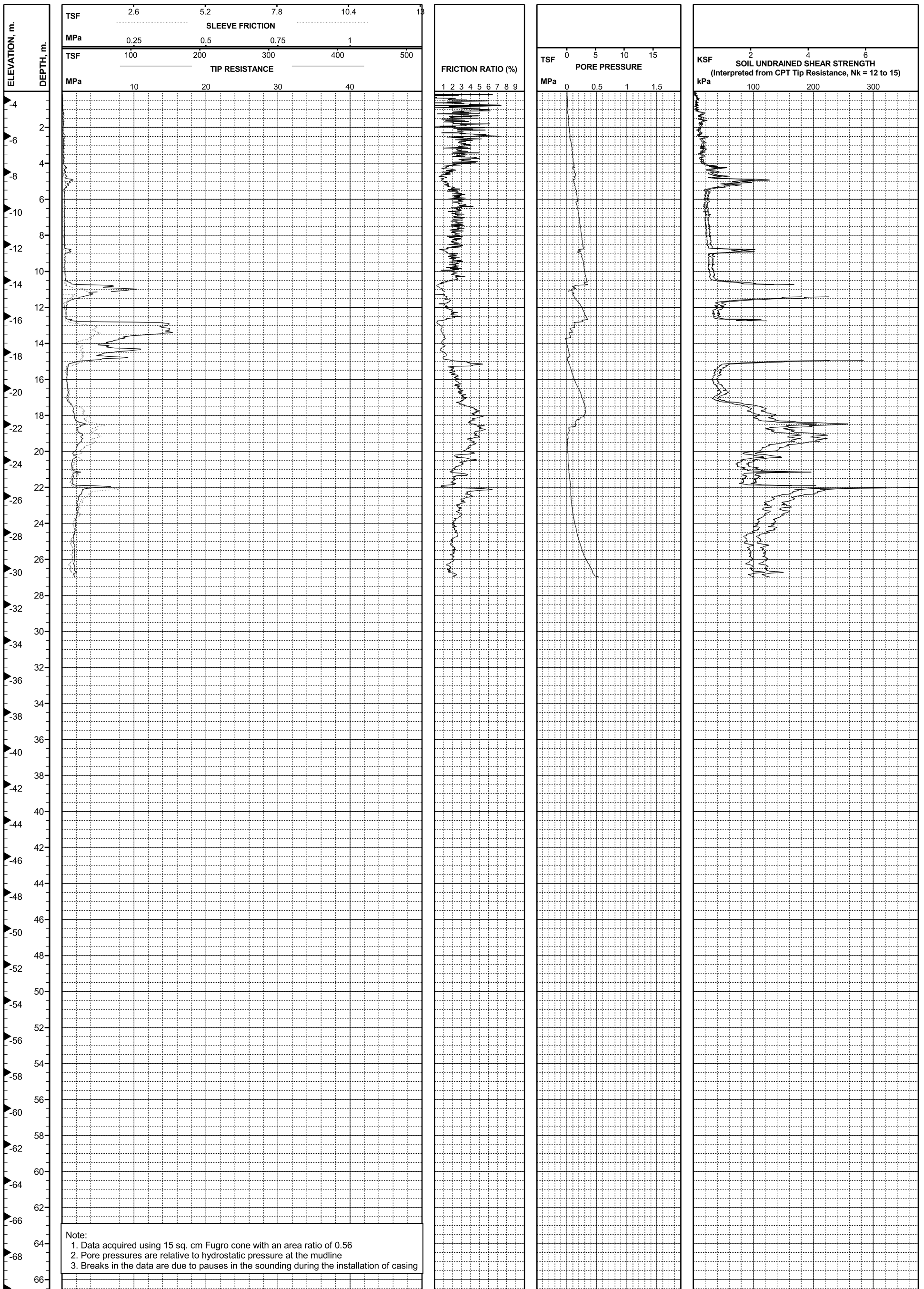


# LOG OF CPT SOUNDING 00C-59

SFOBB East Span Seismic Safety Project



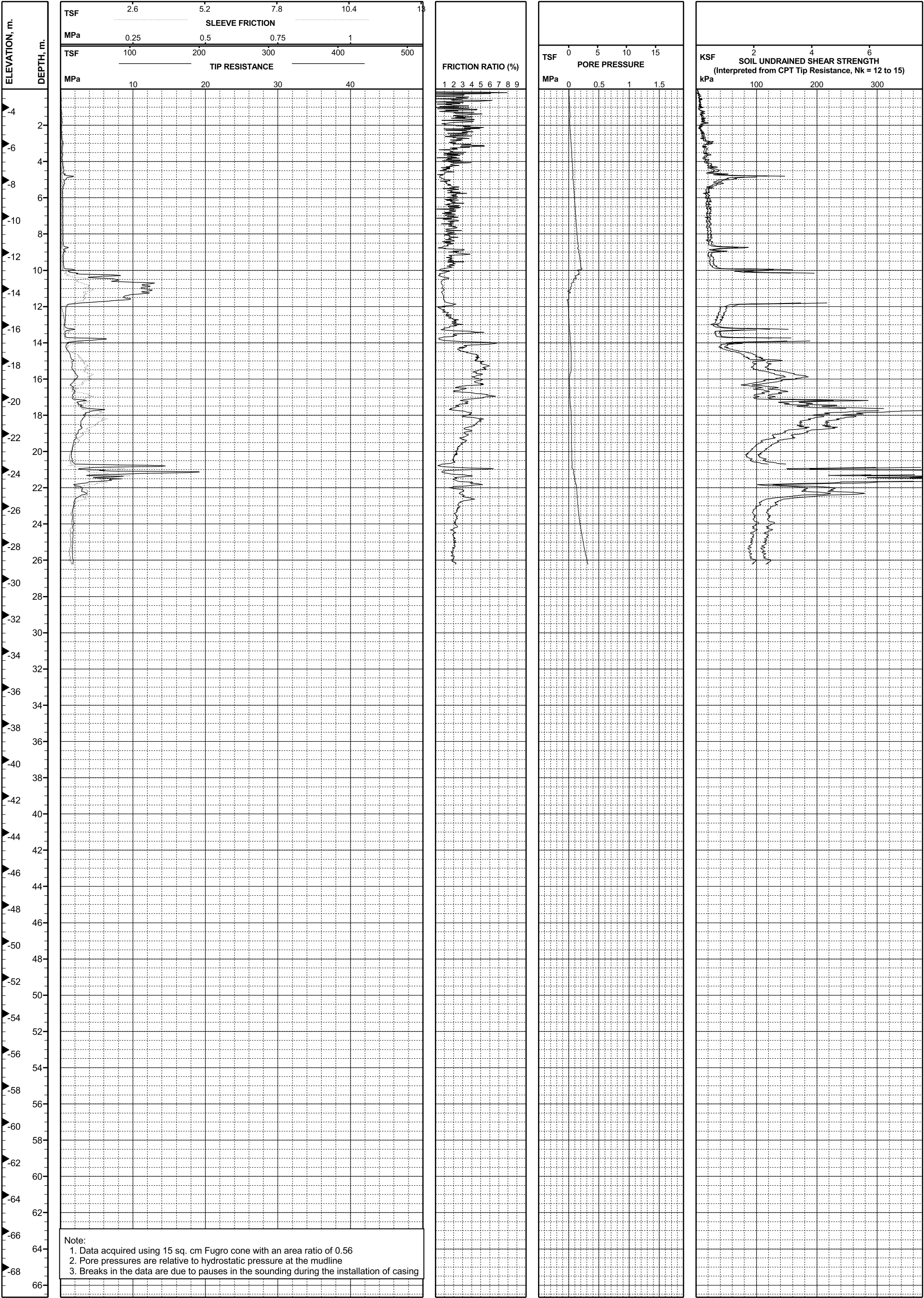
**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/25/00



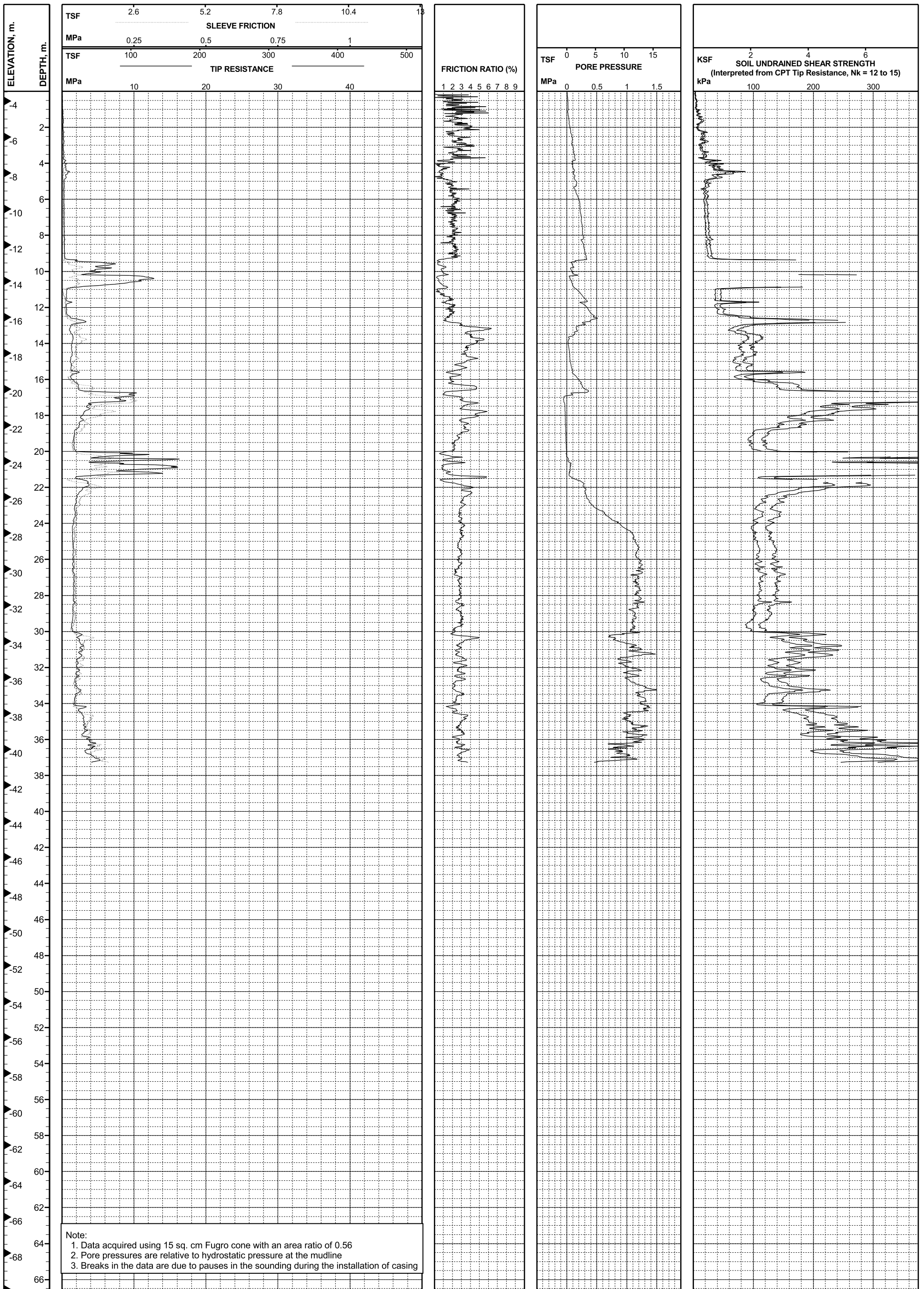
# LOG OF CPT SOUNDING 00C-60

SFOBB East Span Seismic Safety Project





**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/24/00

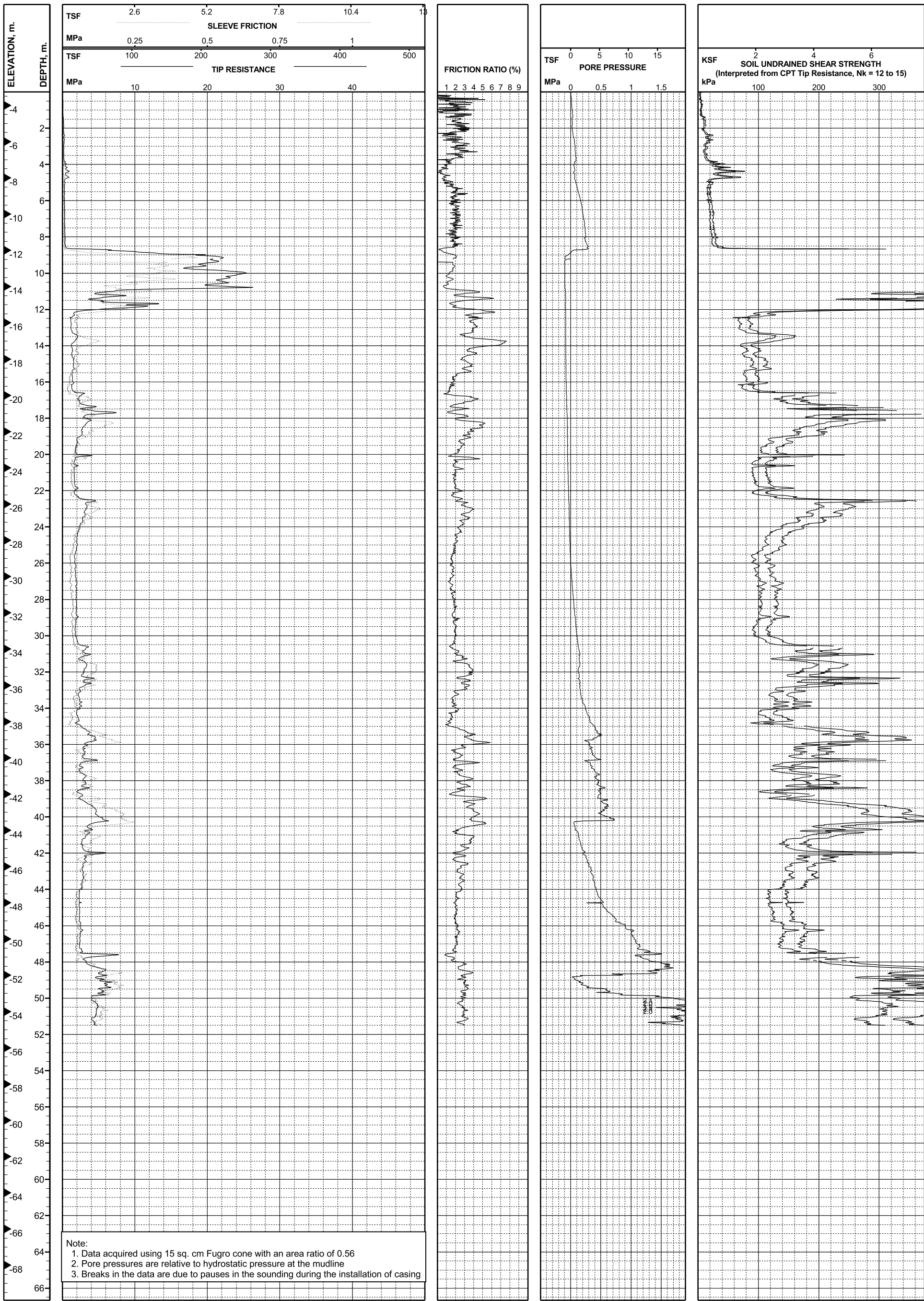


# LOG OF CPT SOUNDING 00C-62

SFOBB East Span Seismic Safety Project



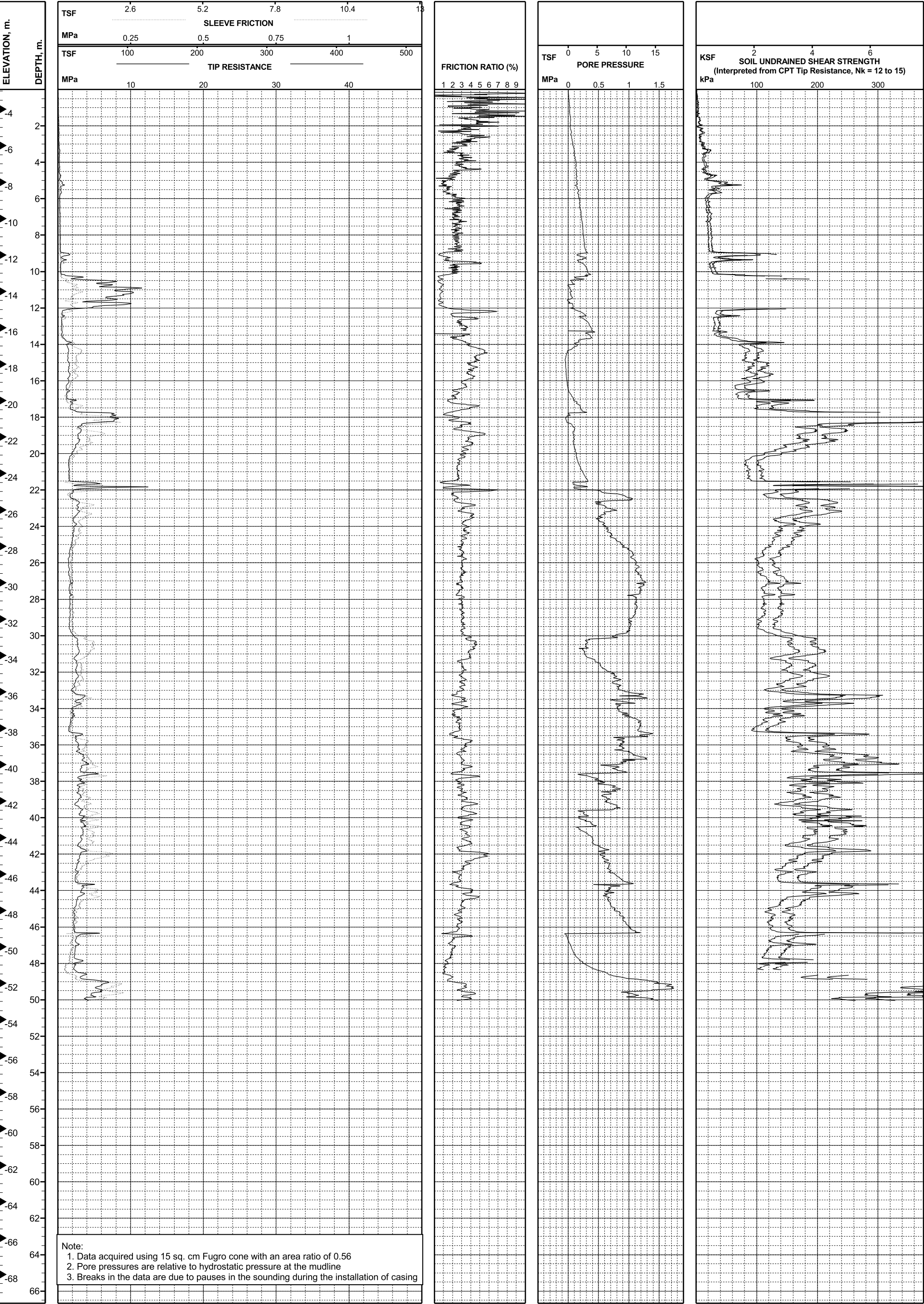
**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/24/00



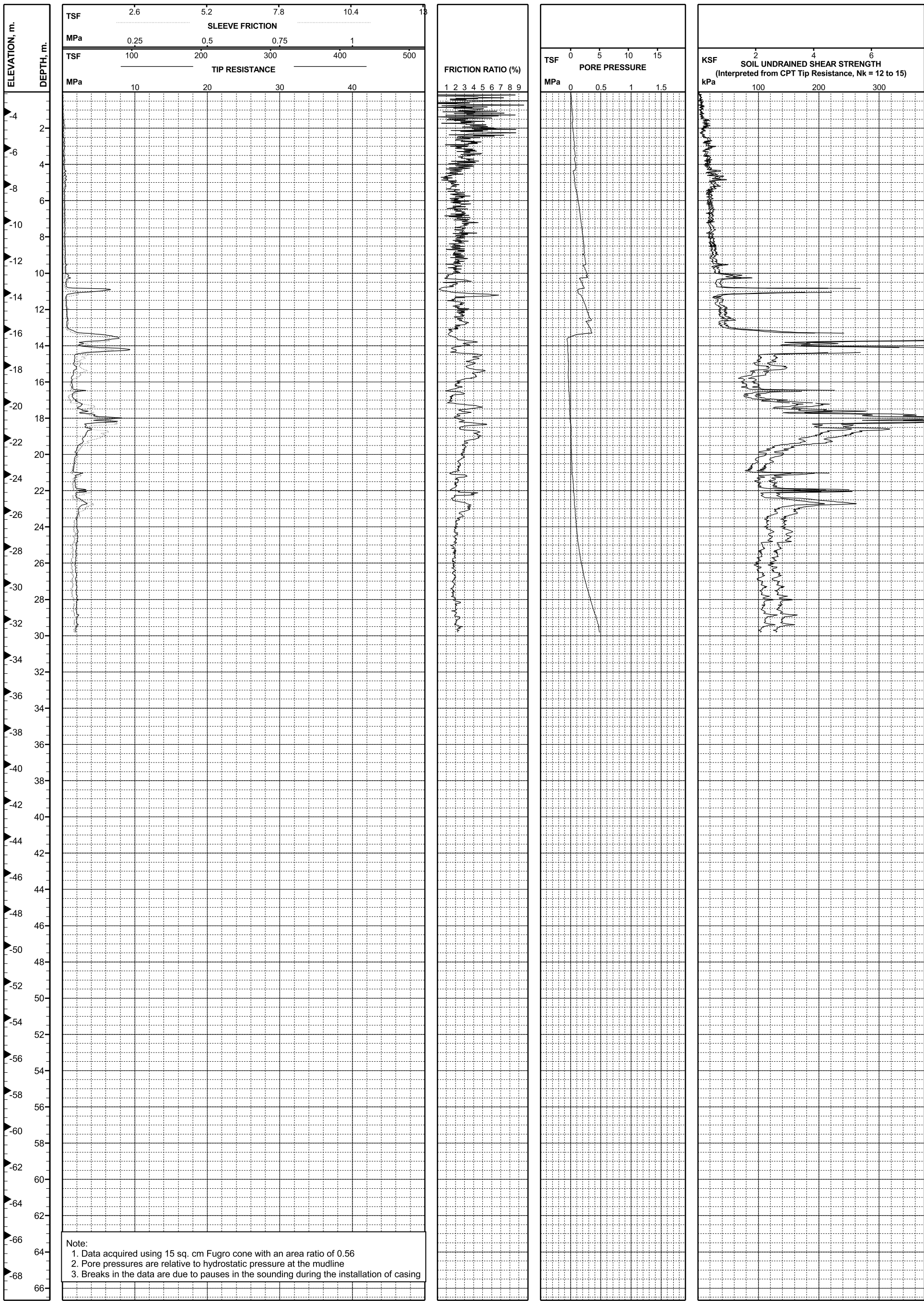
# SFOBB East Span Seismic Safety Project







**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 09/26/00



# LOG OF CPT SOUNDING 00C-65

# SFOBB East Span Seismic Safety Project

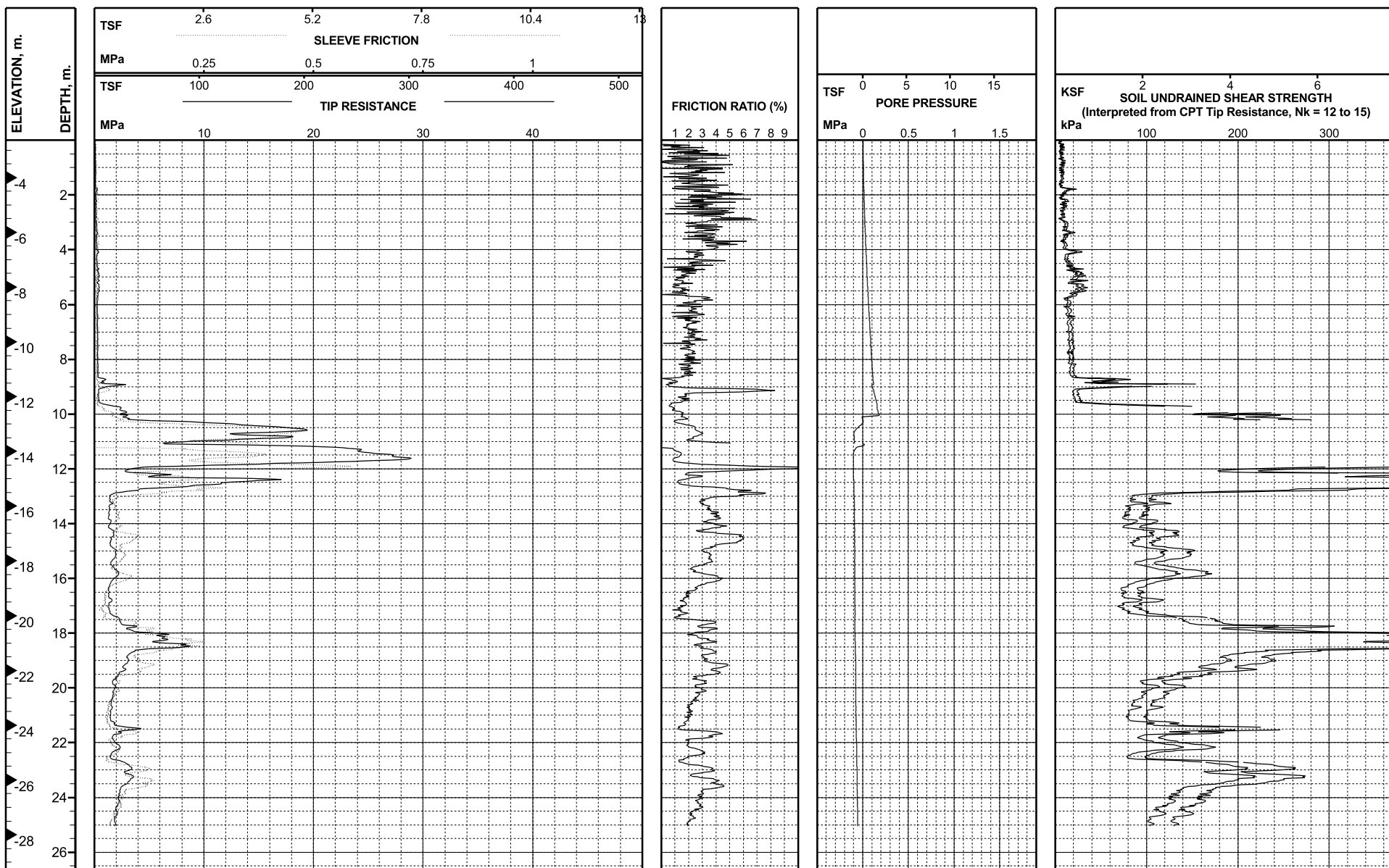




PROJECT NO: 98-42-0059  
SOUNDING: 00C-66 (13 m Right of "W" Stn. 83+20)

COORDINATES: E1838780 N648262 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -2.6 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/25/00



Note:

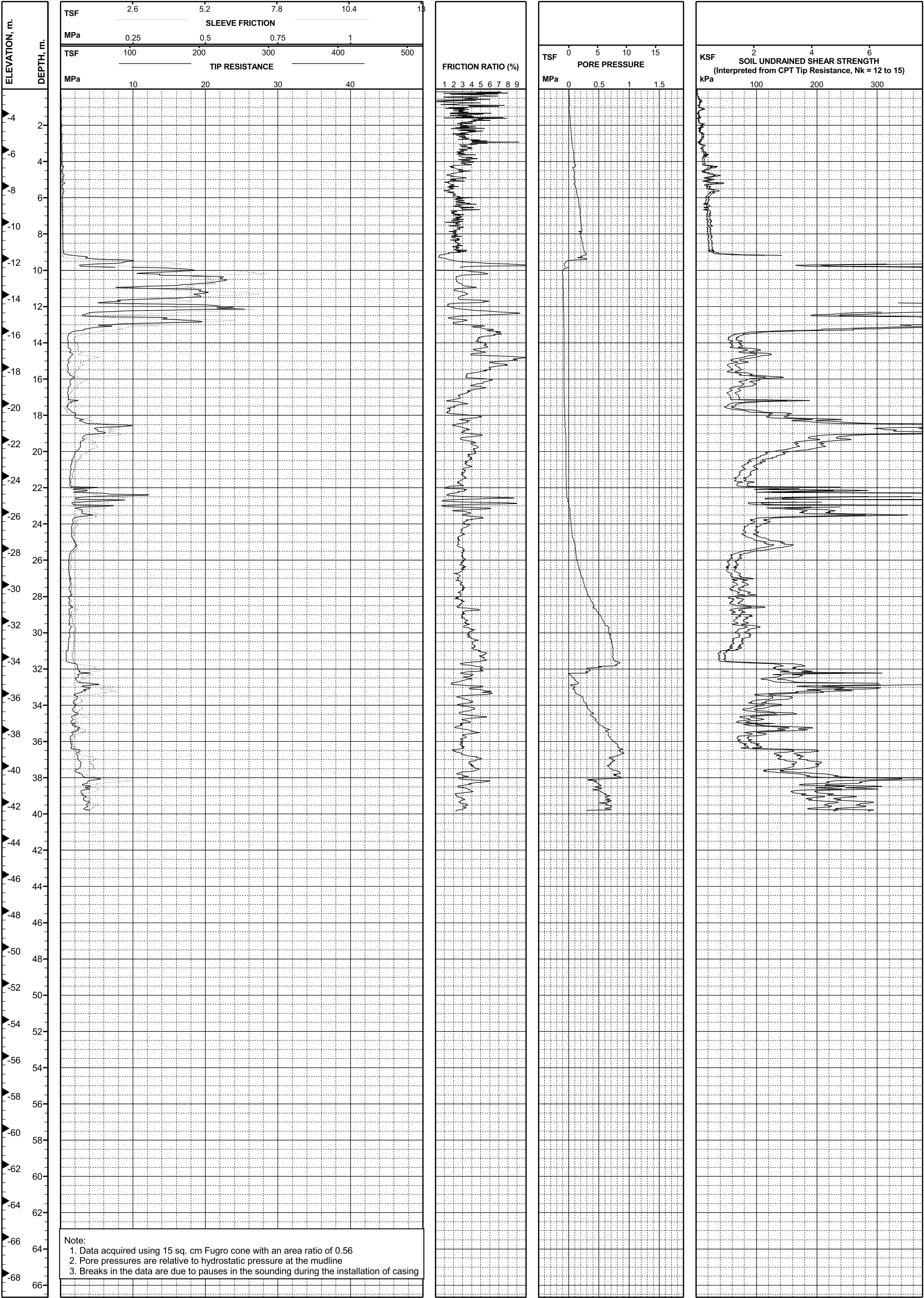
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

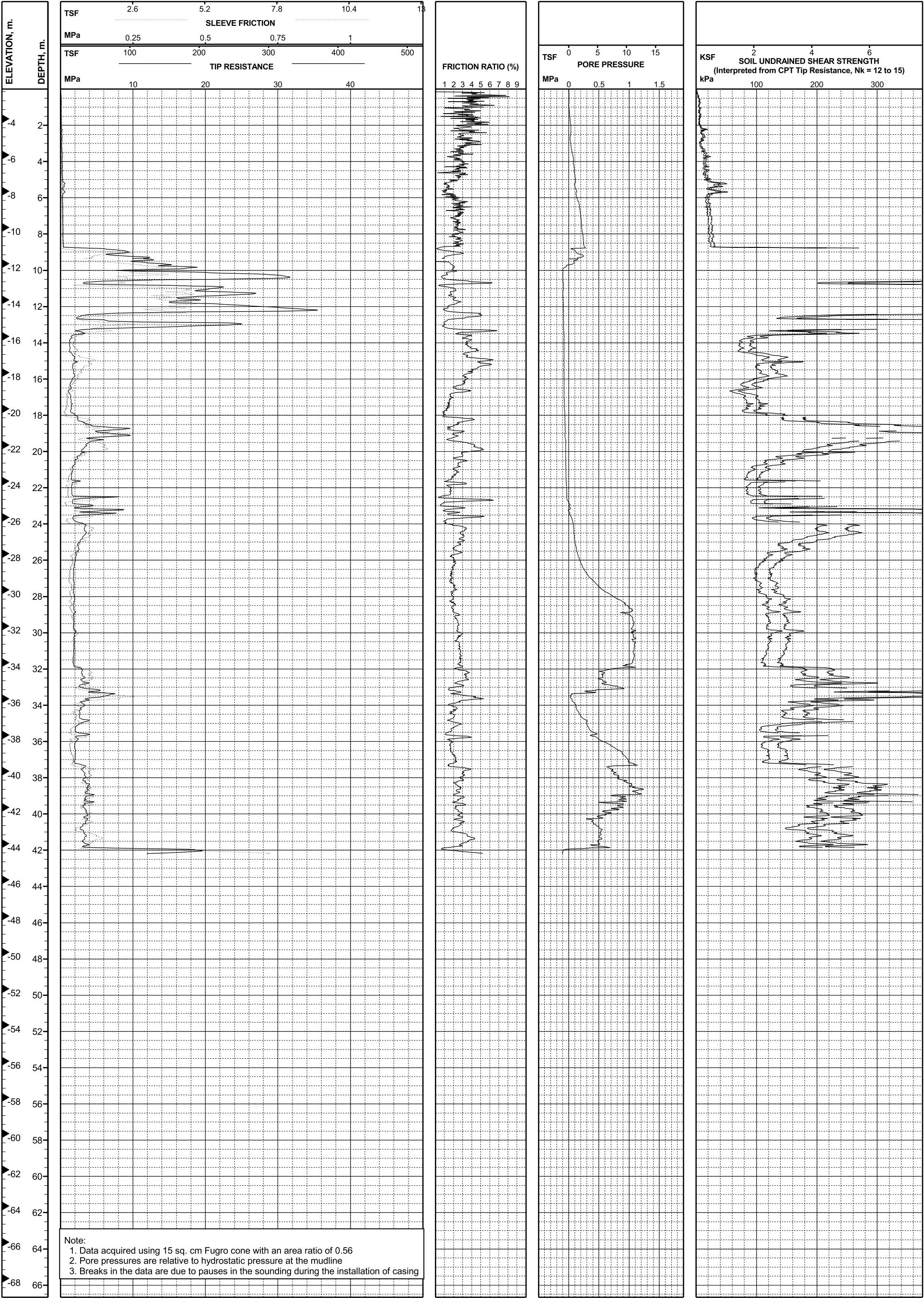
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-66

SFOBB East Span Seismic Safety Project





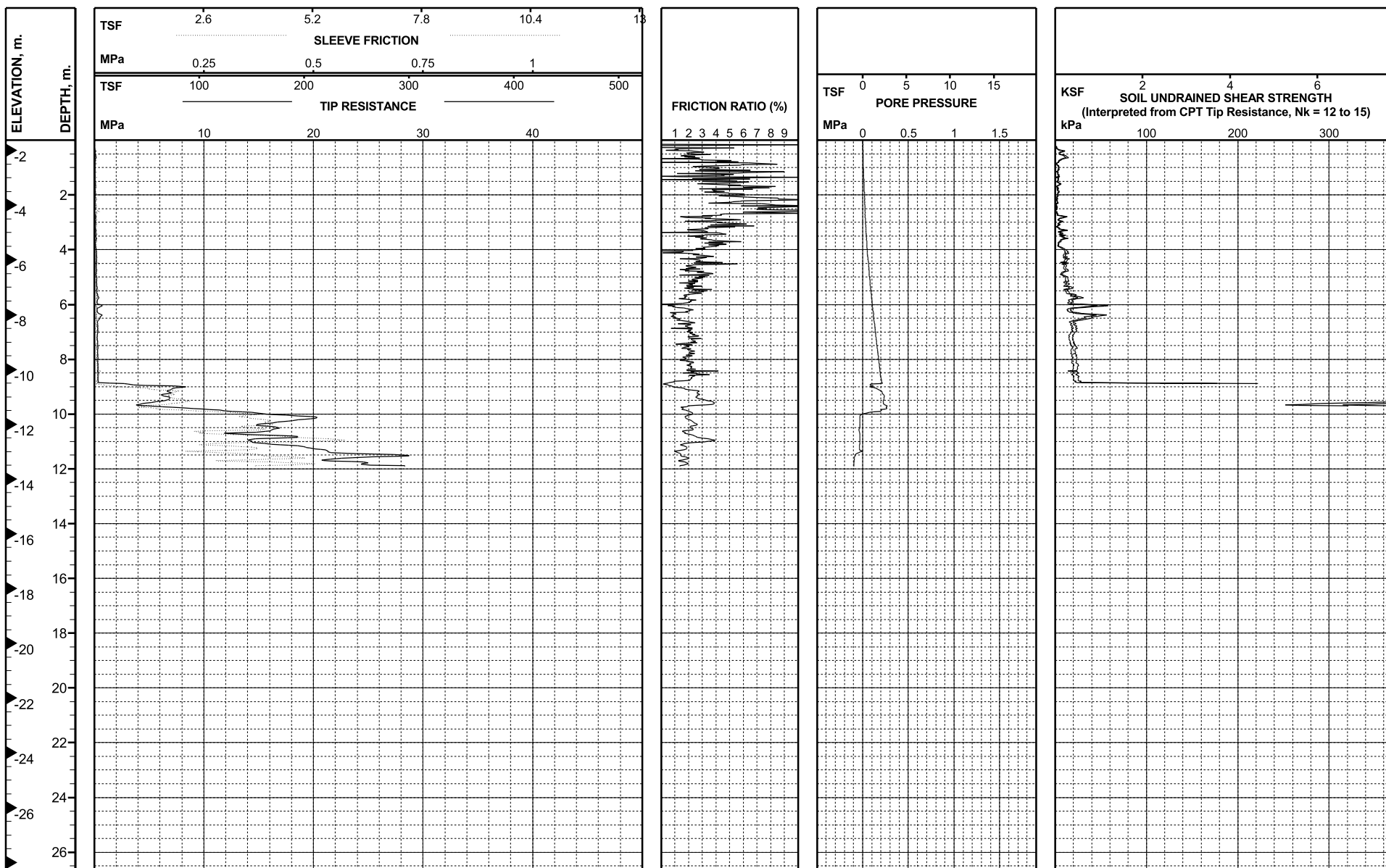




PROJECT NO: 98-42-0059  
SOUNDING: 00C-70 (16 m Right of "E" Stn. 83+59)

COORDINATES: E1838849 N648228 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -1.6 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/24/00



Note:

1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-70

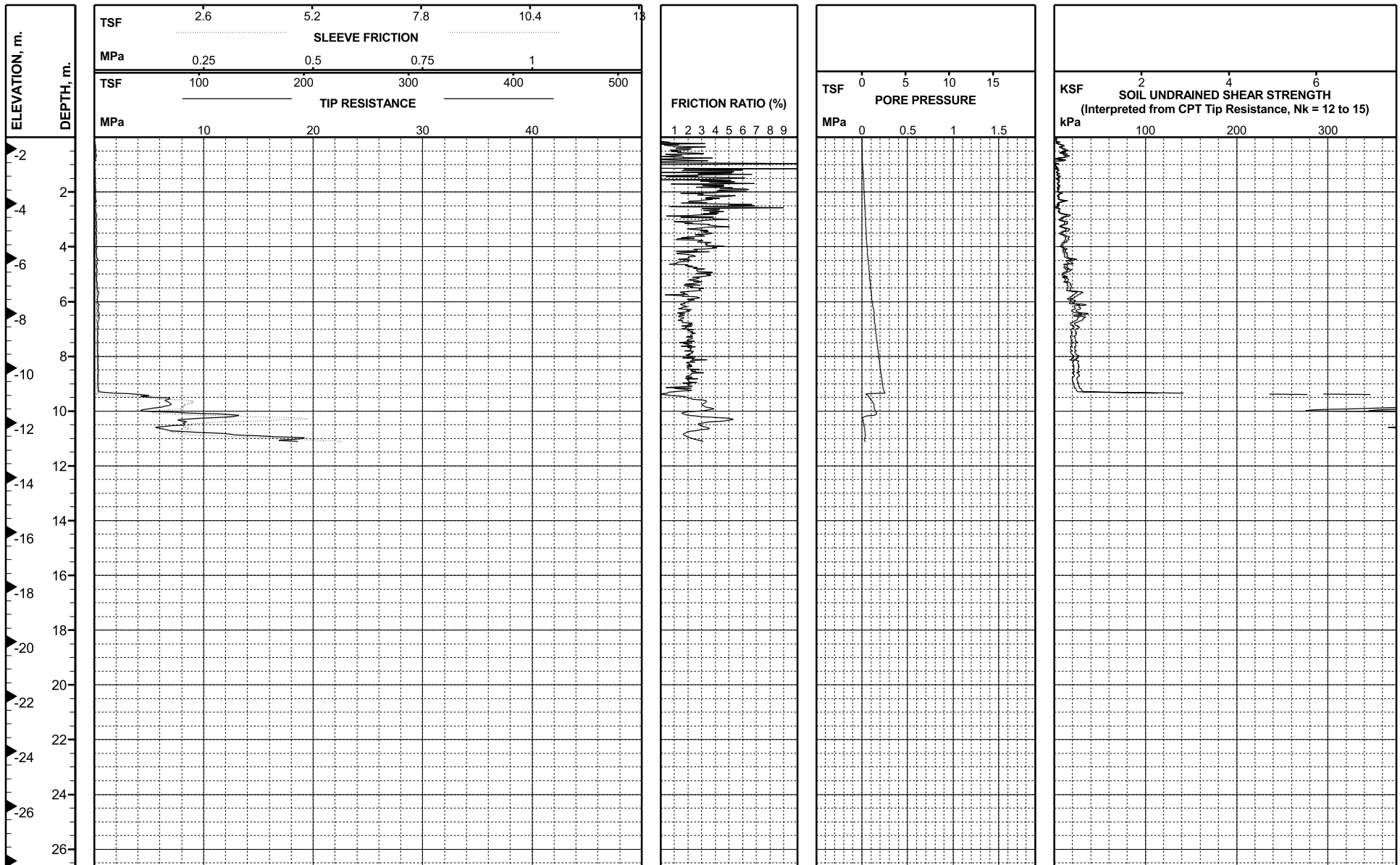
SFOBB East Span Seismic Safety Project



PROJECT NO: 98-42-0059  
SOUNDING: 00C-71 (8 m Left of "E" Stn. 83+59)

COORDINATES: E1838846 N648252 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -1.6 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/24/00



Note:

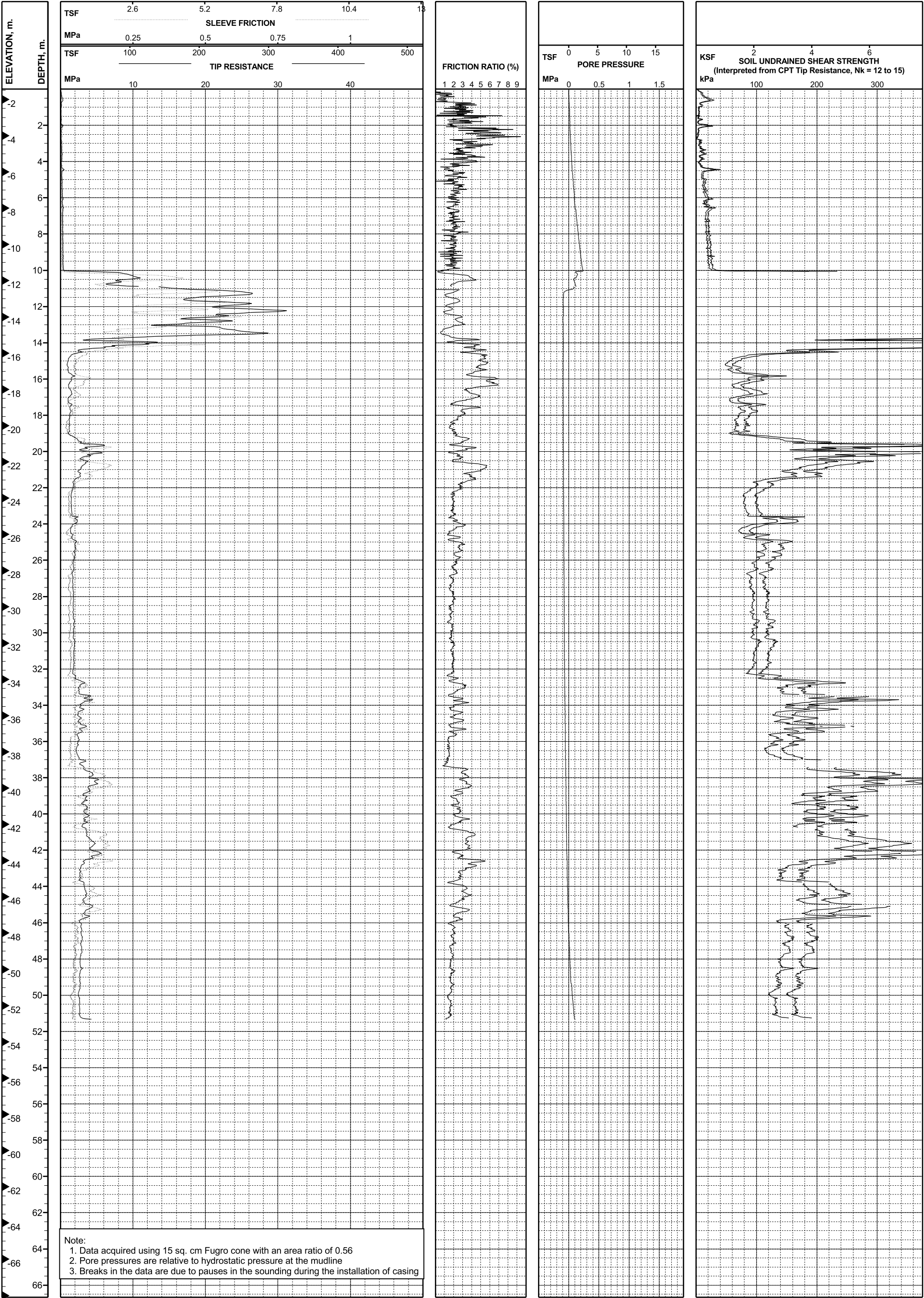
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56
2. Pore pressures are relative to hydrostatic pressure at the mudline
3. Breaks in the data are due to pauses in the sounding during the installation of casing

Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-71

SFOBB East Span Seismic Safety Project



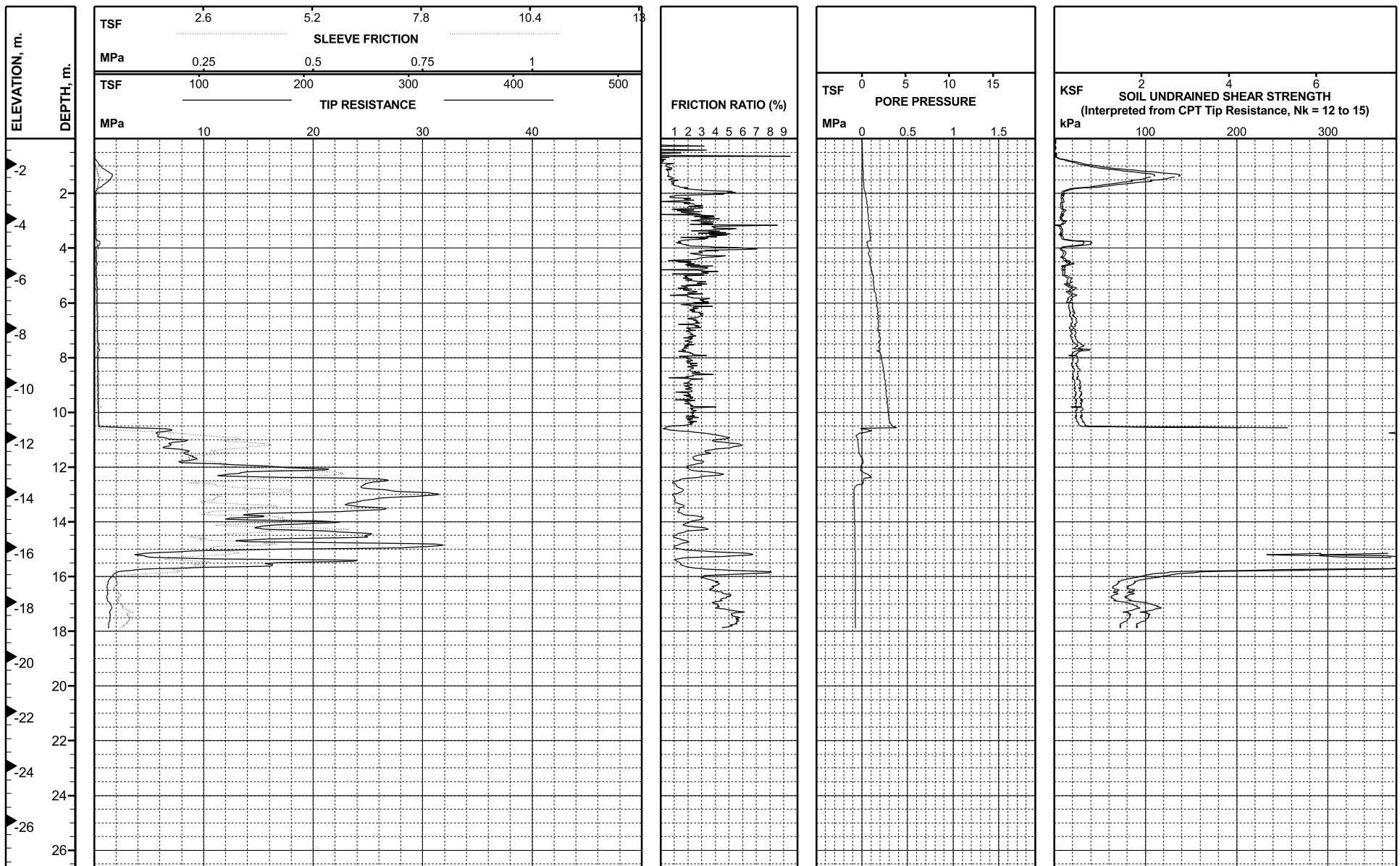




PROJECT NO: 98-42-0059  
SOUNDING: 00C-73 (W Stn. 84+59)

COORDINATES: E1838919 N648292 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -1.1 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/24/00



Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

## LOG OF CPT SOUNDING 00C-73

SFOBB East Span Seismic Safety Project

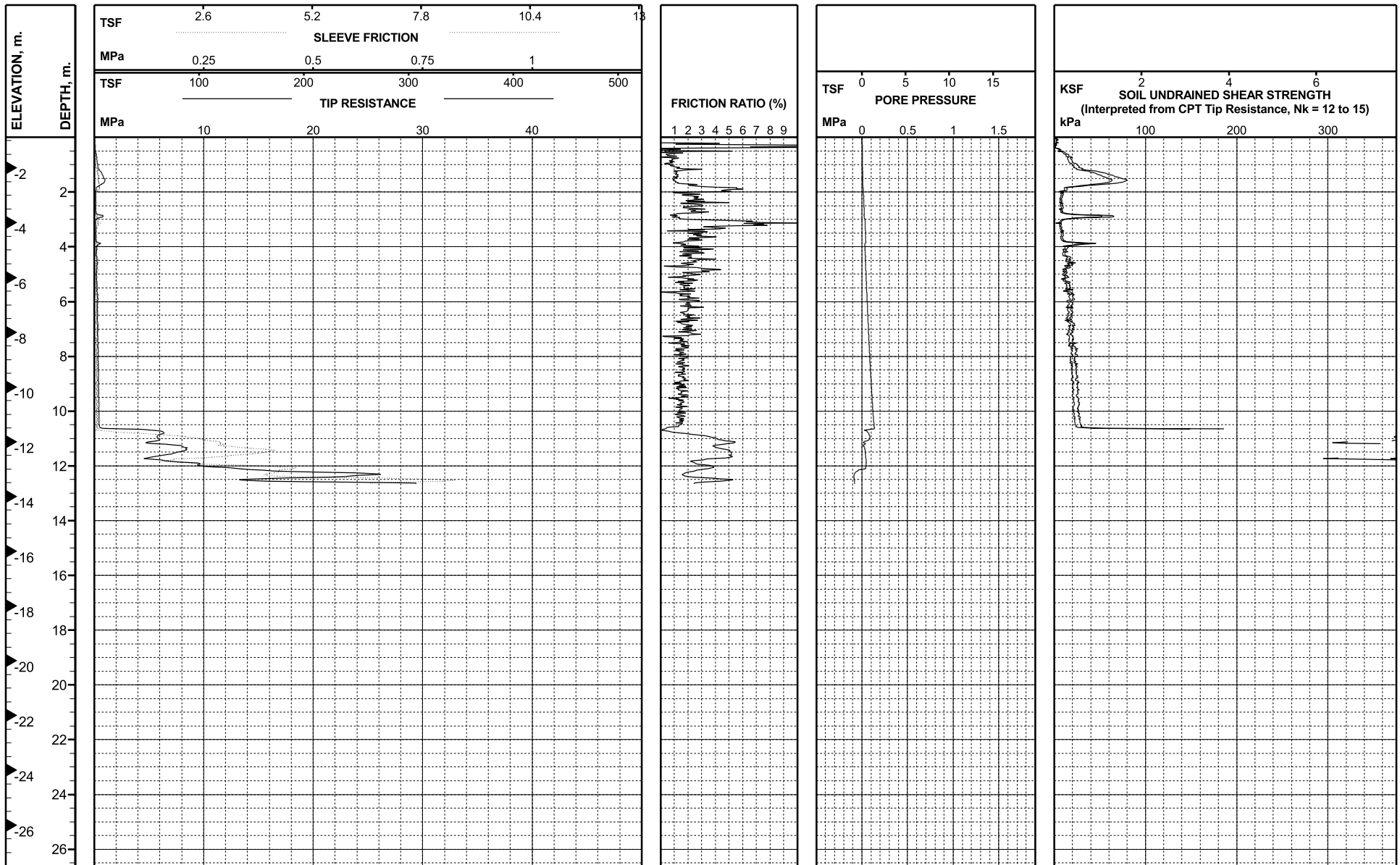




PROJECT NO: 98-42-0059  
SOUNDING: 00C-74 (2 m Right of "W" Stn. 85+00)

COORDINATES: E1838941 N648292 CA State Plane Zone 3, NAD83, meters  
MUDLINE ELEVATION: -0.9 m (MSL)

OPERATOR: Fugro-McClelland Marine Geosciences  
TEST DATE: 09/25/00

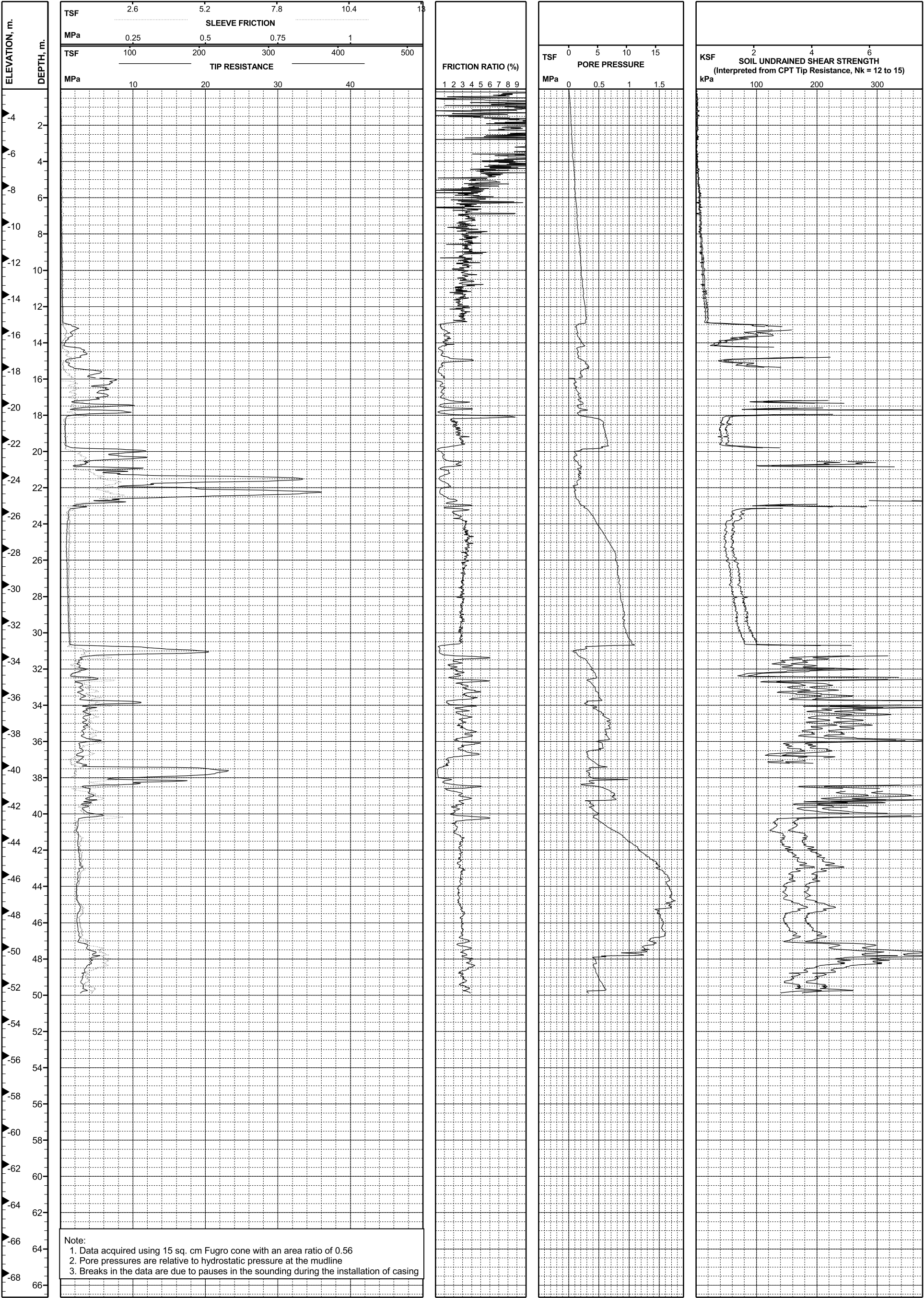


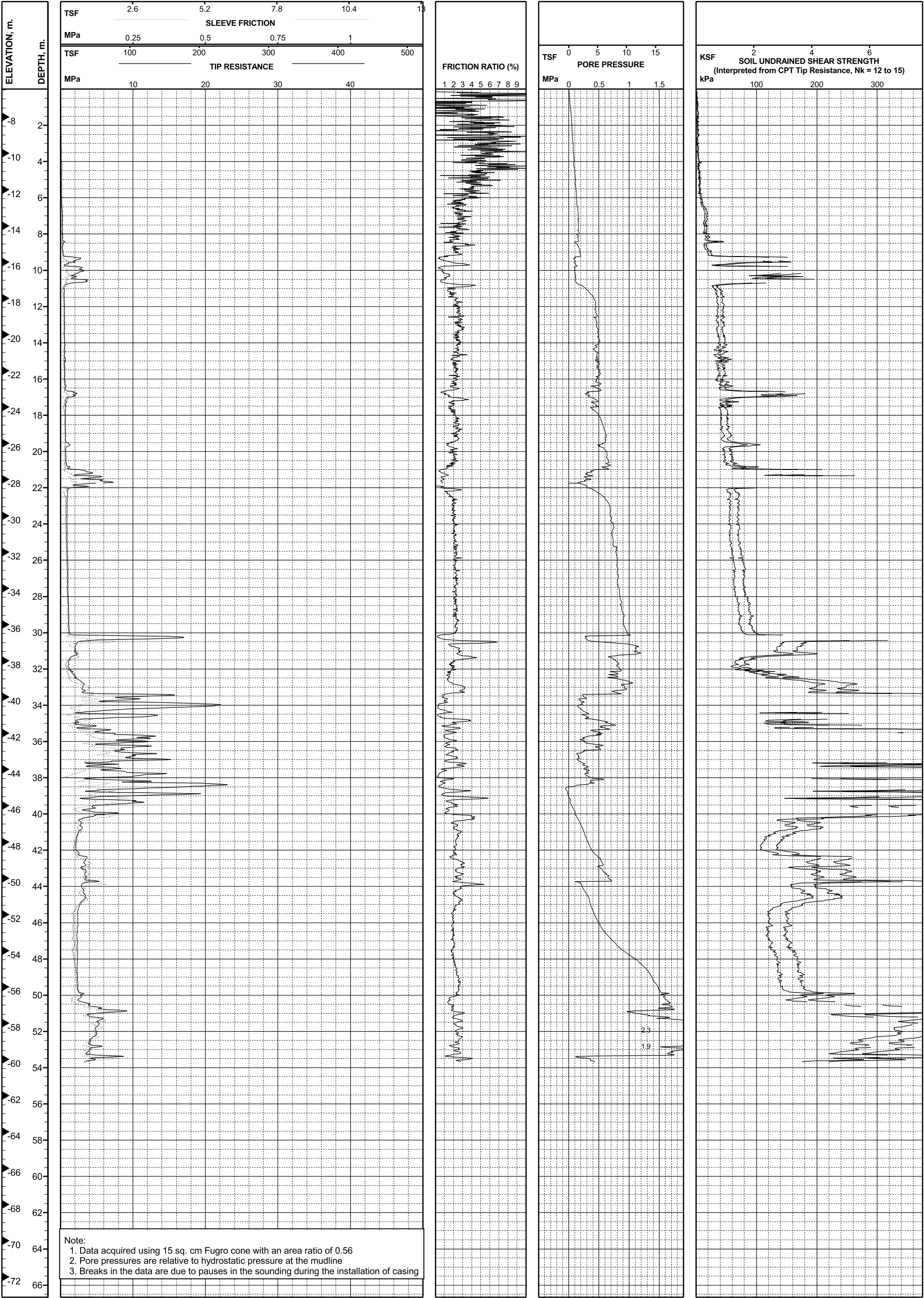
Note:  
1. Data acquired using 15 sq. cm Fugro cone with an area ratio of 0.56  
2. Pore pressures are relative to hydrostatic pressure at the mudline  
3. Breaks in the data are due to pauses in the sounding during the installation of casing  
Report Date: 02/08/01

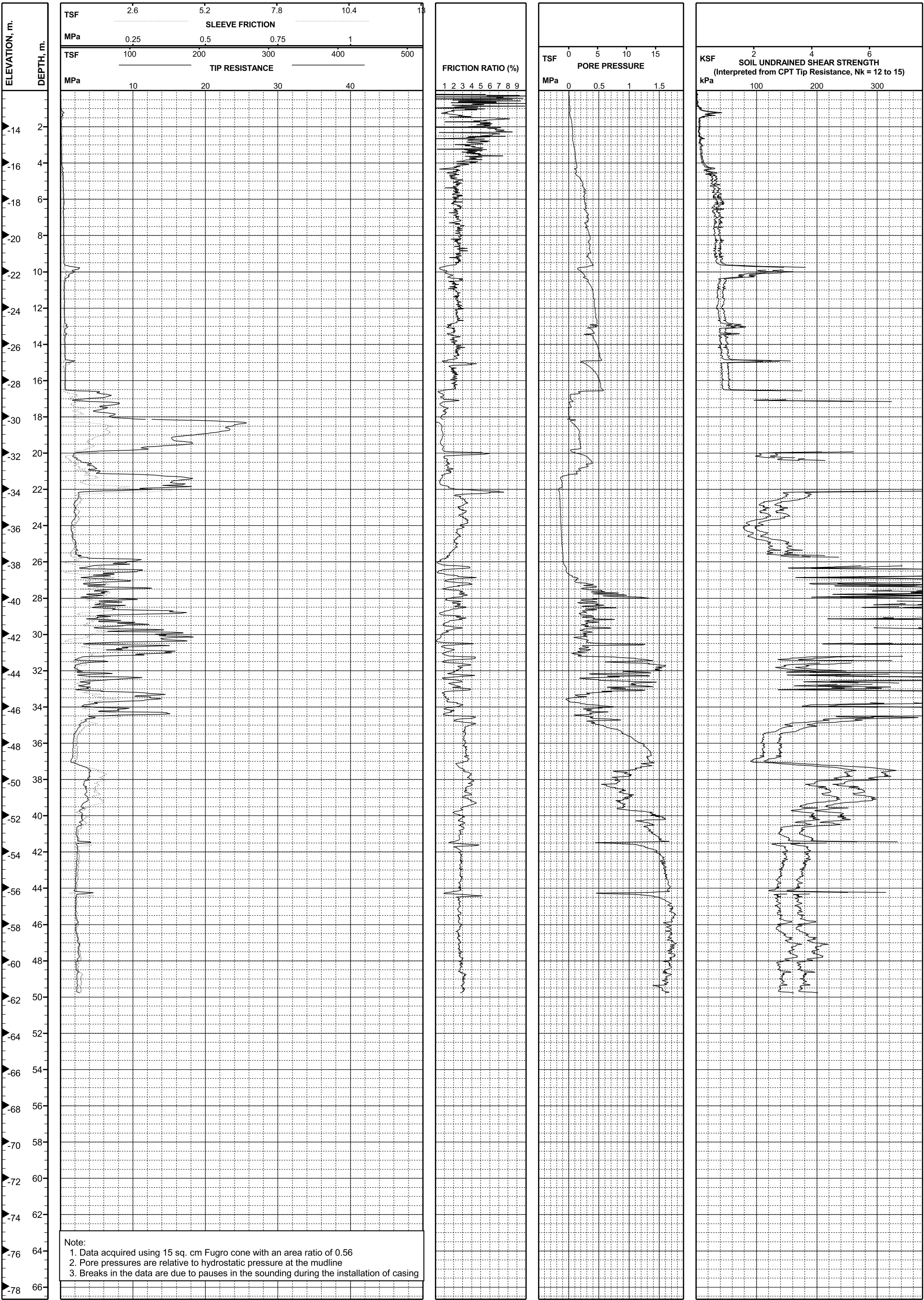
## LOG OF CPT SOUNDING 00C-74

SFOBB East Span Seismic Safety Project

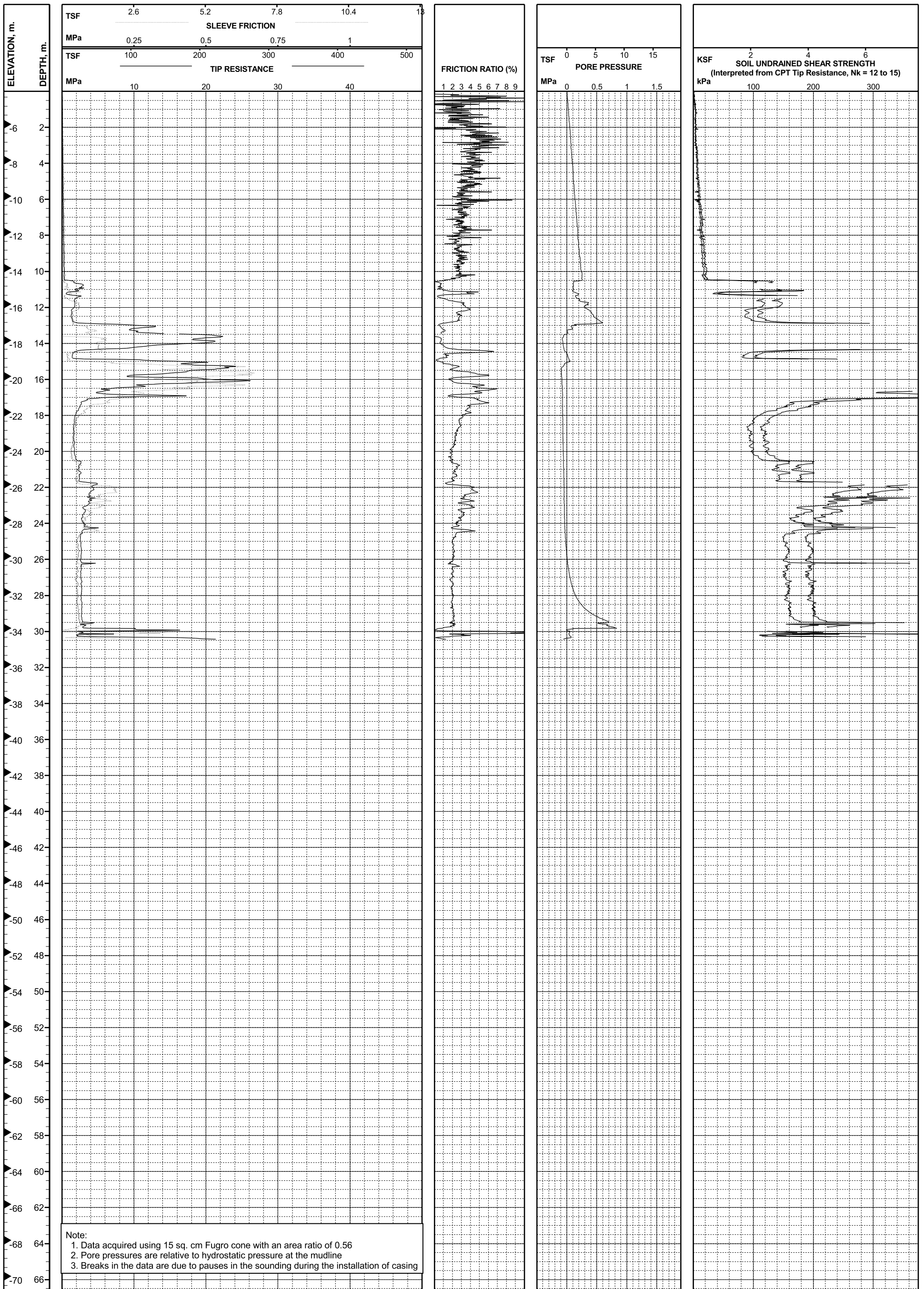








**OPERATOR:** Fugro-McClelland Marine Geosciences  
**TEST DATE:** 10/06/00



# LOG OF CPT SOUNDING 00C-79

SFOBB East Span Seismic Safety Project

